

# 2024 ANNUAL REPORT







Box 1602 | 5014 - 50th Avenue | Yellowknife, NT X1A 2P2 | **Phone** 867.675.0788 | **Email** [ed@gmob.ca](mailto:ed@gmob.ca)

# The Giant Mine Oversight Board at a Glance

## PURPOSE

The 2015 Giant Mine Remediation Project Environmental Agreement (“the Agreement”) established the Giant Mine Oversight Board (“GMOB”). GMOB has two primary purposes:

1. Independently monitor, promote, advise, and support the responsible management of the remediation of the site of the former Giant Mine; and,
2. Manage a research program to seek a permanent solution to the arsenic trioxide dust stored underground at the site of the former Giant Mine.

## MANDATE

To achieve its purposes, GMOB’s mandate is to:

- Monitor and report on the Giant Mine Remediation Project (“the Project”);
- Review, comment, and make recommendations on programs, research, and reports about the Project;
- Support research into a permanent solution for the arsenic trioxide dust stored underground at the site of the former Giant Mine (the “Project site”); and,
- Communicate to the public and Parties to the Agreement (“the Parties”) about GMOB’s activities.

## VISION

GMOB envisions that the remediation of the former Giant Mine site, including the sub-surface, will be carried out in an environmentally sound, socially responsible, and culturally appropriate manner.

## GOVERNANCE

GMOB is governed by a six-member Board of Directors. The six Parties to the Agreement each appoint one member to the Board. Each Director acts independently from the Party making the appointment. The Parties are:

1. Government of Canada, Crown-Indigenous Relations and Northern Affairs Canada
2. Government of the Northwest Territories, Environment and Climate Change
3. Yellowknives Dene First Nation
4. North Slave Métis Alliance
5. Alternatives North
6. City of Yellowknife

The Government of Canada and the Government of the Northwest Territories are Co-Proponents of the Giant Mine Remediation Project. They work together as the Giant Mine Remediation Project Team (“the Project Team”).

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# Message from the Giant Mine Oversight Board

The Giant Mine Oversight Board (GMOB) was created pursuant to the 2015 Giant Mine Environmental Agreement. It is an independent Board composed of individuals appointed by the six signatory Parties. These include the Government of Canada and Government of the Northwest Territories (the Co-Proponents of the Project), Yellowknives Dene First Nation, North Slave Métis Alliance, Alternatives North, and the City of Yellowknife. Once appointed, the members are independent of their appointing organizations. GMOB's Executive Director and external consultants support the Board.

GMOB monitors and supports the responsible remediation of the site of the former Giant Mine. It is also tasked with seeking a permanent solution to the arsenic trioxide dust that is currently stored underground at the site.

## THE GMOB ANNUAL REPORT

This report sets out GMOB's expectations for each of seven key aspects of the Project, a summary of the actions taken in 2024 and their outcomes, GMOB's observations, and what comes next. The report also summarizes GMOB's activities in 2024, including its engagement activities and research endeavors, and provides a status report on past recommendations. This is the ninth annual report issued by GMOB since its establishment.

### RECOMMENDATIONS, OBSERVATIONS, AND GMOB'S APPROACH

An important part of GMOB's role as an independent oversight body is to identify concerns and make **recommendations** to the Project Team with the goal of resolving these concerns. GMOB made a total of 88 recommendations since 2016, with varying levels of complexity ranging from the simple (e.g., updating contact information on a website) to the more challenging (e.g., recommendations related to land-use planning).

GMOB recognizes that its recommendations have not, to date, had their desired impact. Progress on GMOB's recommendations has been slow, and many recommendations have not been fully addressed. In many cases, unaddressed recommendations have either become irrelevant or GMOB has not seen the value in continuing to repeat them.

In an effort to be more effective, GMOB has decided to take a two-step approach, starting with this report. Moving forward, GMOB will begin by making **observations** regarding its concerns, with the intention of discussing them further with the Project Team and collaboratively identifying solutions. In cases where GMOB is confident that it has identified not only the problem but also the necessary steps to address it, GMOB will subsequently provide a **recommendation**. Observations in any given year may become recommendations in future annual reports if GMOB does not feel that they have been adequately addressed. GMOB expects that the Project Team will fully respond to GMOB's observations, provide its views as to the validity of the observations, and be prepared to discuss the observations and its response during the upcoming year. GMOB will follow up on those discussions in its subsequent annual report and determine whether an observation warrants a recommendation.

## GIANT MINE PROJECT UPDATE

The Project remained on schedule and on budget in 2024. Work in the underground was completed and access sealed off. Underground monitoring will continue from the surface, as will monitoring and maintenance of the now-installed submersible pumps. A permanent access portal to the underground will be built in 2026.

In developing this year's Annual Report, GMOB identified a recurring theme when discussing both the successes and concerns around the Project: GMOB's strongest and most persistent concerns reflect the Project's interrelated components (e.g., engineering and environment, economics, long-term planning, etc.) being "siloed" and treated as separate issues. GMOB's most serious concerns (e.g., the Perpetual Care Plan (PCP), the GMOB research program, acute arsenic exposure risk messaging, etc.) apply to many different components of the Project. While the Project Team's approach to current design plans appears focused primarily on engineering concerns, GMOB foresees important and avoidable impacts to the environment, community and perpetual care if the Project does not adopt an integrated approach. Examples of topics that require an integrated approach include:

- **Project Management and Planning:** Engineering decisions have implications for community well-being including economic benefits, perpetual care, future land-use planning, the GMOB research program, a permanent solution's eventual implementation, and more.
- **Long-term planning and the PCP:** Perpetual care extends beyond environmental monitoring and management. It includes land-use planning, which has economic implications and should be informed by acute arsenic exposure risk assessments. It should also include accommodations for future implementation of the permanent solution to the issue of the arsenic trioxide dust currently stored underground.
- **Communication and Engagement:** Certain engineering decisions are being made (e.g., closure of the underground, boat launch closures, etc.) without robust public communication or engagement, despite foreseeable social impacts and implications for long-term planning.

GMOB firmly believes that current and future generations should not be burdened with the risk and liability of the arsenic trioxide dust currently stored underground at the site. In interactions with the Project Team this year, GMOB has observed what it interprets as an approach that is more focused on identifying the barriers to extracting and treating the arsenic trioxide dust (e.g., challenges in extracting 100% of the dust from underground) rather than identifying possible solutions to those barriers. At times it appears that the Project Team may have slipped into a mindset that the "freeze in place" method is a permanent rather than a temporary measure. GMOB remains convinced that the arsenic trioxide dust can be extracted and treated safely and successfully. It is actively researching solutions to the challenges of extraction and treatment. It recognizes the opportunities that will result from this program, including advancements in technologies, significant economic opportunities, and removing the liability and risks presented by indefinite storage of the arsenic trioxide dust stored underground. In this report, we summarize research progress in



2024 and outline GMOB's decision to further fund research into vitrification, which GMOB considers highly promising given initial results, extraction methodologies, and further dust characterization.

The Board, its Executive Director, and GMOB's partners recognize and appreciate the efforts that all parties have made in working toward successfully remediating the site. While GMOB has identified several concerns in this Annual Report, GMOB acknowledges that much has also been accomplished. We strongly encourage all involved to recommit to fully engaging in implementing their respective responsibilities in a cooperative and effective manner. Only by doing so can the site's remediation and closure be done in a manner that is environmentally sound, economically beneficial, socially responsible, and culturally appropriate.

David Livingstone  
Chair, Giant Mine Oversight Board

## Project Oversight in 2024

For GMOB, project oversight involves monitoring, reviewing, and commenting on documents and presentations relevant to the Project. It also includes attending meetings, seeking expert advice, making recommendations, and promoting public awareness and engagement. GMOB's project oversight activities fall into seven interrelated areas of responsibility:

- 1. ENVIRONMENT**
- 2. ECONOMY**
- 3. COMMUNICATION, ENGAGEMENT, AND RECONCILIATION**
- 4. PROJECT MANAGEMENT AND PLANNING**
- 5. COMMUNITY HEALTH AND WELL-BEING**
- 6. LONG-TERM PLANNING**
- 7. GMOB RESEARCH PROGRAM**

**EACH PROJECT OVERSIGHT RESPONSIBILITY IS BRIEFLY DISCUSSED, WHERE APPLICABLE, TO ANSWER THE FOLLOWING QUESTIONS:**

- WHY IS THIS IMPORTANT?**
- WHAT DOES GMOB EXPECT?**
- WHAT ACTIONS WERE TAKEN?**
- WHAT WERE THE OUTCOMES OF THE ACTIONS?**
- WHAT DOES GMOB OBSERVE?**
- WHAT ARE THE NEXT STEPS?**

## Acronyms

<b>AAC</b>	Aquatics Advisory Committee
<b>AEMP</b>	Aquatic Effects Monitoring Program
<b>Board</b>	Appointed directors of the Giant Mine Oversight Board
<b>CIRNAC</b>	Department of Crown-Indigenous Relations and Northern Affairs Canada
<b>DFO</b>	Department of Fisheries and Oceans
<b>ETP</b>	Effluent Treatment Plant
<b>GHG</b>	Greenhouse Gas(es)
<b>GMOB</b>	Giant Mine Oversight Board, including the Board and staff.
<b>GMRP</b>	Giant Mine Remediation Project (“the Project Team”)
<b>GMWG</b>	Giant Mine Working Group
<b>GNWT</b>	Government of the Northwest Territories
<b>IOC</b>	Indigenous Opportunities Considerations
<b>MCM</b>	Main Contract Manager (currently Parsons Corporation)
<b>MVEIRB</b>	Mackenzie Valley Environmental Impact Review Board
<b>MVLWB</b>	Mackenzie Valley Land and Water Board
<b>NSERC</b>	Natural Sciences and Engineering Research Council
<b>NSMA</b>	North Slave Métis Alliance
<b>NWT</b>	Northwest Territories
<b>OCAP®</b>	Ownership, Control, Access and Possession
<b>PCP</b>	Perpetual Care Plan
<b>PIP</b>	Project Implementation Plan
<b>PPE</b>	Personal Protective Equipment
<b>PSIB</b>	Procurement Strategy for Indigenous Business
<b>PSPC</b>	Public Services and Procurement Canada
<b>RFP</b>	Request for Proposals
<b>TERRE-NET</b>	Toward Environmentally Responsible Resource Extraction Network
<b>TRC</b>	Truth and Reconciliation Commission of Canada
<b>UNDRIP</b>	United Nations Declaration on the Rights of Indigenous Peoples
<b>WHO</b>	World Health Organization
<b>WLU</b>	Wilfrid Laurier University
<b>YKHEMP</b>	Yellowknife Health Effects Monitoring Program
<b>YKDFN</b>	Yellowknives Dene First Nation



# PROJECT OVERSIGHT

## ENVIRONMENT

*The Environment section discusses planning, activities, monitoring, and reporting related to the Project in 2024. Specifically, this section focuses on **environmental risks and monitoring**, such as air and water quality, spills and prevention measures, contingency planning, and more.*

### WHY IS THIS IMPORTANT?

Reducing and eliminating environmental risks associated with the former Giant Mine site is the fundamental priority for the Giant Mine Remediation Project and an important consideration for Yellowknife, Ndilo, and Dettah residents.

A healthy environment contributes to the overall health and well-being of the communities. This priority aligns with the Giant Mine Remediation Project's primary goal to protect human health and safety and the environment. Decisions made now have implications for non-engineering and long-term considerations for the site, for example:

- Climate change assumptions used in design plans affect the vulnerability of the site and its infrastructure to climate-change related events for perpetual care (see [Project Management and Planning](#)).
- Changed access to the underground has implications for the implementation of a permanent solution for the arsenic trioxide dust (see [Project Management and Planning](#)).
- The remediation standard applied to contaminated soils, and identification of remaining high-risk areas, affect the degree of risk for future site users. These decisions have implications for land-use planning, the PCP, and risk communication (see [Community Health and Well-being and Long-term Planning](#)).

**Section 2.2** of the Giant Mine Remediation Project Environmental Agreement ("the Agreement") states that the Parties intend the Agreement will achieve or support the following objectives:

- a. the remediation of the Giant Mine site in a manner that protects the land, air, water, aquatic life, and other wildlife in the area of or potentially affected by the Project;
- b. the remediation of the Giant Mine site in a manner that eliminates or substantially mitigates the environmental risks posed by the site;
- c. comprehensive, integrated ecosystem-based approaches for the monitoring, management, and regulation of the Project; and,
- d. the minimization of the Perpetual Care requirements at the Giant Mine site.

Section 3.1 (b) (v) of the Agreement enables GMOB to compile and analyze available and relevant environmental quality data to review, report, or make recommendations about "environmental or engineering studies conducted by the Co-Proponents in relation to the Project."

## WHAT DOES GMOB EXPECT?

**GMOB expects the Project Team to develop and implement effective management, monitoring, design, and construction plans, consistent with guidelines and best available methods, in all phases of the Project.** GMOB considers comprehensive emergency response and contingency plans as essential components of the Project. GMOB recognizes that plans may evolve as the project moves forward.

**GMOB expects the Project Team to develop an updated Aquatic Effects Monitoring Program (AEMP; see Box 2)** as required by its Type A Water Licence. Project activities are underway that will increase the geographic area of potential impacts to aquatic ecosystems, including building a new water treatment plant that will discharge treated effluent directly into Back Bay. Remediation activities will also include placing covers over submerged tailings and contaminated sediment in the Bay.

**GMOB expects the AEMP update process to follow the Mackenzie Valley Land and Water Board (MVLWB) *Guidelines for Aquatic Effects Monitoring Programs*,<sup>1</sup>** including but not limited to:

- documenting all historical and remediation-related aquatic issues in Back Bay and Yellowknife Bay;
- providing a comprehensive reference document that summarizes issues and concerns raised by affected Parties;
- identifying key connections between the Project and the receiving environment for each issue or concern identified;
- providing an updated conceptual AEMP design ahead of the formal submission to the Land and Water Boards; and,
- allowing Parties to engage on the proposed sampling and statistical design at a time where meaningful input is still possible.

**GMOB expects the Project Team and all site contractors to adhere to the Spill Contingency Planning and Report Regulations** pursuant to the Northwest Territories (NWT) Environmental Protection Act with respect to reporting spills. Per the Environmental Protection Act, this compliance includes “reasonable effort[s] to notify every member of the public who may be adversely affected by [a] discharge or likely discharge.” It also requires that the Project Team, “without any reasonable delay, provide the Oversight Body [GMOB] a report of any reportable spill, accident or significant malfunction.” GMOB expects both contingency plans (including spills and emergency events) and the PCP to be aligned and coordinated with the City of Yellowknife and with engagement of all the Parties.

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<sup>1</sup> MVLWB/GNWT. 2019. *Guidelines for Aquatic Effects Monitoring Programs*. <https://mvlwb.com/media/766/download?inline>

**GMOB expects the Project Team's designs, site operations, and communications to account for longer-term considerations,** including but not limited to:

- evolving **climate change projections** and their implications for both design plans and perpetual care;
- the **Perpetual Care Plan (PCP)**, which is now in development, and is expected to include land-use planning considerations; and,
- emerging findings from **GMOB's research program**, including clearly communicating a) the temporary nature of freezing the arsenic trioxide dust stored underground, and b) the search for a permanent solution through GMOB's research program.

GMOB will continue to request information on remediation plans that may affect the research program and a permanent solution for the arsenic trioxide dust. Considerations include maintaining access to the chambers for future extraction and safe storage of the arsenic trioxide dust, and ensuring that surface sites are available for arsenic trioxide dust treatment in the future.

**GMOB expects the Giant Mine Working Group (GMWG) to meet regularly.** The GMWG provides feedback to the Project Team on remediation plans. GMWG meetings provide a useful opportunity for the Project Team to update the Parties on Project activities, and for the Parties to review upcoming submissions to the MVLWB.

Working Group members are:

- Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC);
- Public Works and Government Services Canada;
- Government of the Northwest Territories (GNWT);
- Environment and Climate Change Canada (ECCC);
- Department of Fisheries and Oceans (DFO);
- Alternatives North;
- Yellowknives Dene First Nation (YKDFN);
- North Slave Métis Alliance (NSMA);
- Health Canada; and,
- City of Yellowknife.



## WHAT IS AN AQUATIC EFFECTS MONITORING PROGRAM (AEMP)?

Project activities have the potential to impact aquatic environments. Impacts include planned discharges (e.g., treated effluent), foreshore remediation, and more. All of these impacts have the potential to affect water quality or quantity, aquatic habitats, and aquatic life.

As part of water license requirements, the MVLWB may require project proponents to monitor aquatic effects through an Aquatic Effects Monitoring Program (AEMP). An AEMP includes details on how the proponent will monitor, analyze, report, and respond to the results of monitoring. It identifies thresholds (“Action Levels”) that trigger specific management responses. A well-designed AEMP will be able to answer the following questions:

- How do the measured environmental effects compare with predicted effects?
- Are environmental effects related to the project within acceptable limits?
- Are there trends in measured environmental effects that suggest impacts are worsening over time?
- What actions will be triggered if thresholds are exceeded?

**Engagement** is an important component of AEMP development and is expected in multiple stages. *The MVLWB Guidelines for Aquatic Effects Monitoring Programs*<sup>2</sup> outlines a range of pre-engagement steps that are recommended before the proponent submits its AEMP for licensing. The purpose of pre-engagement is to identify questions of concern to affected communities and Indigenous organizations/governments early enough in the process to address them collaboratively. Effective pre-engagement helps strengthen the AEMP and reduces the likely number and extent of changes the regulator may require upon submission.

## WHAT ACTIONS WERE TAKEN?

The Project is currently in the active remediation phase. This means that several design plans have been approved by the MVLWB, and physical work is occurring on-site to complete the activities described in the Closure and Reclamation Plan.

GMOB acknowledges the progress made by the Project Team as on-site engineering and environmental monitoring work continue.

## MONITORING AND REPORTING

The Project has fulfilled the monitoring and reporting requirements of its Type A Water Licence issued by the MVLWB in 2020. During 2024, the Project Team provided the required reports and implemented measures to minimize environmental impacts during active remediation.

GMOB did not identify any significant concerns in its review of monitoring and inspection reports in 2024 (Box 3). Overall, the Project Team continued to prioritize environmental management and safety throughout the year. GMOB has drawn the following conclusions from the Project's 2024 reports:

- Air quality is consistently good at and near the mine site, and in nearby communities.
- The effluent discharged into Baker Creek met the standard set by the Water Licence. Water and aquatic life monitoring results for Back Bay and Baker Creek found no marked change over previous years.
- Spill reports submitted by CIRNAC identify that most spills that occurred were below the reportable threshold, and were resolved quickly and appropriately. Three spills above the reportable threshold also occurred, but did not cause notable environmental impacts. These spills included:
  - 100 L of diesel fuel spilled from a scrap vehicle,
  - 28 cubic metres of paste backfills coming back out into the pit, and
  - 1,500 L of mine water due to a bleed valve failure.

GMOB continues to meet with the Project Team, Project inspectors and other regulatory bodies to strengthen mutual communication and information sharing.

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2 MVLWB/GNWT. 2019. Guidelines for Aquatic Effects Monitoring Programs. <https://mvlwb.com/media/766/download?inline>

3 CIRNAC and GNWT. 2024. Giant Mine Remediation Project Closure and Reclamation Plan – Annual Update (Version 3.0). 65 pp. [https://registry.mvlwb.ca/Documents/MV2007L8-0031/GMRP%20-%20Closure%20and%20Reclamation%20Plan%20Annual%20Update%20Version%203.0%20-%20Dec%2020\\_24.pdf](https://registry.mvlwb.ca/Documents/MV2007L8-0031/GMRP%20-%20Closure%20and%20Reclamation%20Plan%20Annual%20Update%20Version%203.0%20-%20Dec%2020_24.pdf)

## **REPORTS AND PLANS REVIEWED BY GMOB IN 2024**

### **The Project Team:**

- 2023 GMRP Annual Report

### **MVLWB Reviews:**

- 2023 Aquatic Effects Monitoring Program Annual Report
- 2023 Water Licence Annual Report
- Borrow Design Plan, Version 1.1
- Open Pits Design Plan Version 1.0
- Water Treatment Plant Construction Plan, Revision 2
- Closure and Reclamation Plan – Annual Update, version 3.0
- Water Management and Monitoring Plan Version 5.0
- Erosion and Sediment MMP, version 3.0
- Annex A SNP Proposed Updates
- 2022 Aquatic Effects Monitoring Program Response Plan – Close Out Report
- 2024 Aquatic Effects Monitoring Program Re-evaluation Report

### **Other Reports:**

- Water Treatment Plant Construction Plan, Revision 2 and 3
- Fisheries Act Authorization, Version 1.0
- Non-hazardous Waste Landfill – As-built Report
- Closure and Reclamation Plan – Annual Update
- 2022 Aquatic Effects Monitoring Program Response Plan – Close Out Report
- Emergency Management and Spill Response Plan, Rev. 1
- Monitoring and Inspection Reports required under the Water License
  - Including: 2023 Annual Geotechnical Inspection,  
Land Use Inspector - Inspection Reports
- Transport Canada Authorization
- Climate Change Memos – AR6 Climate Change Report and AR6 Review
- Working Group documents
- YKHemp tracking and reporting

## PROJECT ACTIVITIES

The Project Team continued the following activities during 2024:

- Continued care and maintenance activities, including the management of:
  - waste storage areas,
  - wastewater discharge,
  - dust control on roads,
  - dust control on tailings containment areas,
  - monitoring and reporting on air and water quality, and
  - responses to inspections.
- Construction of the new water treatment plant, which will discharge treated effluent directly into Back Bay.
- Developing an updated AEMP for Back Bay and Yellowknife Bay.

The inspector appears to be generally satisfied with the Project Team's responses to its concerns and with the level of communication.

The Project Team has reportedly completed work on, and sealed access to, the underground portion of the Project in 2024. GMOB is awaiting the final update on the details of this work's completion, confirmation from the mining inspector that the underground workings have been closed appropriately and successfully, and details as to how the underground will be accessed for potential emergencies and extraction of the arsenic trioxide dust.

## PLANNING

The Project Team expanded its Spill Contingency Plan to become a larger Emergency Management and Spill Response Plan (EMSRP),<sup>4</sup> which now includes a section on site evacuation. It also now includes a section on wildfire, which describes air quality, smoke, and personal protective equipment (PPE) implications for emergency management services. An Incident Action Plan for a wildfire event is included in an appendix to the EMSRP.

Concerns regarding a pump failure in 2021, delays in replacing it, and associated communications were raised in prior GMOB Annual Reports. In 2024, the "shelf-spares" pump (formerly stored in Leduc, Alberta) was installed to replace the failed pump, which had failed multiple times and ultimately could not be repaired. The now-installed spare acts primarily as a redundancy in case the main pump fails. Originally, the Project maintained two installed pumps — one primary pump and one redundancy — and the shelf spare. The Project no longer maintains a shelf spare. The Project Team provided an

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4 Giant Mine Remediation Project Main Construction Manager. 2024. Emergency Management and Spill Response Plan. Prepared for Public Services and Procurement Canada. Prepared by Parsons Inc. Yellowknife, NWT. 132 pp. [https://mvlwb.ca/Documents/MV2007L8-0031/GMRP%20-%20Emergency%20Management%20and%20Spill%20Response%20Plan%20-%20Revision%201%20-%20June12\\_24.pdf](https://mvlwb.ca/Documents/MV2007L8-0031/GMRP%20-%20Emergency%20Management%20and%20Spill%20Response%20Plan%20-%20Revision%201%20-%20June12_24.pdf)

update to the GMWG on the steps being taken to resolve the pumping issues, but it has not provided the results of the investigation on the root cause of the pump failures. New pumping locations will be commissioned for the new water treatment plant, which will begin operating in 2026.

### **Aquatic Effects Monitoring Program**

The Aquatics Advisory Committee (AAC), established in 2020, continues to provide guidance on mitigations and monitoring decisions for Baker Creek and Back Bay. The AAC met once in 2024 to present the Project Team's updated AEMP design, and there were opportunities to ask questions. GMOB expected to receive the draft AEMP to review and provide comments in 2024. A draft has not yet been received, and GMOB now expects the Project Team will engage with GMOB, the Parties, and other affected parties in 2025.

### **Soil quality guidelines**

In May 2023, the GNWT released a new draft soil quality guideline for contaminated site remediation, including specific guidelines for soil arsenic in Yellowknife.<sup>5</sup> This guideline has not yet been finalized by the GNWT. GMOB has repeatedly expressed two key concerns related to these guidelines:

1. The new guidelines use "ambient background" soil arsenic levels as the reference level for determining exceedances. The Canadian Council of Ministers of the Environment (CCME) defines ambient background as representative concentrations that reflect natural geologic variations and *may be affected by regional industrial activities*. This is different than "natural background," which is defined as the naturally occurring concentrations of a substance due to local geologic conditions, *without the influence of industrial sources*. The ambient background arsenic in and near Yellowknife is influenced by historical roaster stack emissions and is thus higher than naturally occurring arsenic in the Yellowknife area.<sup>6</sup>
2. The Project Team has stated it will continue to follow GNWT's 2003 soil quality guidelines, per the terms of its Water License rather than following the updated soil quality guidelines — including after the updated guidelines become final.

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5 GNWT. 2023. Appendix 6: Remediation Soil Quality Guidelines for Arsenic in Yellowknife and Inuvik. In: Draft 2022 Environmental Guideline for Contaminated Site Remediation. 3 pp. <https://www.gov.nt.ca/ecc/sites/ecc/files/resources/appendix6-soilquality-arsenic.pdf>

6 Palmer, M.J., H.E. Jamieson, A.B. Radková, K. Maitland, J. Oliver, H. Falck and M. Richardson. 2021. Mineralogical, geospatial, and statistical methods combined to estimate geochemical background of arsenic in soils for an area impacted by legacy mining pollution. *Science of the Total Environment* 776: 145926. <https://doi.org/10.1016/j.scitotenv.2021.145926>

## WHAT WERE THE OUTCOMES OF THE ACTIONS?

### *Monitoring and reporting*

Based on the available information, GMOB has not identified any significant environmental issues associated with the mine site or remediation activities in 2024. Minor concerns related to monitoring and inspections were remedied in an appropriate and timely manner, including the three spills noted previously (fuel, backfill paste and a valve failure). As remediation activities intensify, it is possible that the scale and nature of spills may also increase. GMOB will continue to monitor these events closely.

In 2024, the AEMP report addressed monitoring that occurred in 2023. The AEMP includes biological monitoring every third year and focuses on water quality in the interim years. The 2023 AEMP was an interim year and did not identify any “action level” exceedances for water quality. Monitoring in Baker Creek did identify an increasing trend in the concentration of major ions and 13 metals. However, these increases were attributed to generally dry conditions in the Yellowknife region and were not attributed to project activities. The Project Team’s investigations into the three Action Level Exceedances reported in 2023 (based on monitoring in 2022) found that:

- The increasing trend in six metals potentially linked to groundwater flowing under the Calcine Pond were linked to legacy effects from historic mining operations and not Project activities.
- Concentrations of nutrients and metals in Baker Creek were of sufficient magnitude to have caused the observed increased liver size in male and female Slimy Sculpin. However, no ecological implications are expected from these Action Level Exceedances. Despite increased relative liver size compared to reference areas, Slimy Sculpin are surviving and reproducing in Baker Creek.

The Project Team will continue to monitor water quality trends in Baker Creek per the requirements in the current AEMP Design Plan and Water Licence.

No exceedances of the Effluent Treatment Plan discharge limits were identified in the Surveillance Network Monitoring in 2024. Monitoring reports showed that the effluent discharge met the standards set out in the Water Licence.

One arsenic air quality exceedance was detected at the North Tailings Pond monitoring station by the Giant Mine Ambient Air Quality Monitoring Program in June 2024. The Project Team attributed the exceedance to a combination of heavy machinery activity and strong winds. GMOB does not consider the wind speeds to have been unusually high and has questioned whether other factors may have contributed. While the cause of the exceedance has not been conclusively identified, subsequent sampling has not shown high readings, suggesting that the Project Team’s dust management strategies are effective overall.

In 2024, GMOB received research information from the University of Waterloo regarding water movement from the Northwest Tailings Containment Area into the underground. This information was part of a study the University of Waterloo is conducting at the request of the Project Team. GMOB has requested more information regarding this water

movement from the Project Team but had not received any information at the time this annual report was finalized. GMOB will formally request more information from the Project Team once the results of this research are final.

The Project Team's greenhouse gas (GHG) tracking data from 2023–24 are included in its Annual Report,<sup>7</sup> which is publicly available on the GMOB website.

## **PLANNING**

The Northwest pumping station now has two functional pumps installed, with the original (functional) pump maintaining the water level and the former shelf-spare pump as a backup. The Project no longer maintains a shelf-spare pump, and to GMOB's knowledge has no plan to procure a new shelf spare. GMOB looks forward to reviewing the root cause analysis and diagnostics reporting results on the failed pump when they become available.

### ***Aquatic Effects Monitoring Program***

While GMOB intended to review the updated AEMP in 2024, it has not yet been made available for review. GMOB is particularly interested in the monitoring program design, specifically its reference sites and how the Project Team is demonstrating alignment with the MVLWB's AEMP guidance on engagement. GMOB looks forward to reviewing the updated AEMP in 2025 and participating in the Project Team's engagement activities for this document.

### ***Soil quality guidelines***

GMOB is of the view that pre-development background values are a more appropriate reference level for the updated soil quality guidelines. However, it acknowledges that given the decades of contamination from industrial sources, pre-development background values are ultimately impractical and could, in theory, have costly implications for property owners in and near Yellowknife.

Despite GMOB's concerns around the updated soil quality guidelines, GMOB disagrees with the Project Team's decision not to adopt the updated guidelines in its remediation. GMOB considers it best practice to remediate to the highest standard supported by the most current evidence, to avoid costly future work. Likewise, GMOB considers that adopting the new standards, once finalized, would be most consistent with the objectives and principles set out in the Environmental Agreement and best practices.

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<sup>7</sup> CIRNAC and GNWT. 2024. Giant Mine Remediation Project Annual Report 2023–24. 152 pp. <https://gmob.ca/wp-content/uploads/2025/01/2024-12-18-GMRP-Annual-Report-2023-2024.pdf>



## WHAT DOES GMOB OBSERVE?

### *Observation OBS-2024-1*

The Project Team's estimated submission dates for several plans to the MVLWB (e.g., Waste Management and Monitoring Plan, updated AEMP Design Plan, etc.) have been delayed. While these date changes do not appear to be impacting the overall remediation schedule, GMOB is concerned that delays may lead to a less rigorous and timely review. GMOB will continue to monitor submission timelines.

### *Observation OBS-2024-2*

The draft updated AEMP has yet to be shared with interested parties for comment and pre-engagement, despite being expected in 2024. GMOB maintains the critical importance of the pre-engagement period for identifying community concerns and working collaboratively toward an AEMP design that satisfies affected communities and parties. GMOB is concerned that delays are shortening the pre-engagement period, at the cost of the quality of the pre-engagement review and, ultimately, the AEMP design itself.

### *Observation OBS-2024-3*

The GNWT Draft 2023 *Environmental Guideline for Contaminated Site Remediation* referenced throughout this section remains unfinalized. As long as the guidelines are not final, the implications for remediation and long-term land-use planning remain unclear.

## WHAT ARE THE NEXT STEPS?

GMOB will continue to:

- review environmental management plans and monitoring reports;
- monitor the development of the updated AEMP, including the engagement undertaken in the development of the update; and
- share concerns and issues through direct dialogue with the Project Team and Parties as well as in comments to the MVLWB.

GMOB continues to look forward to learning more details regarding the City of Yellowknife's land-use planning with respect to the Project Area. GMOB anticipates that the City's next update of the Community Plan may include some of these details and will review the Community Plan closely upon its release.

GMOB will continue to work with the City, the GNWT, and the Project Team to ensure that land-use planning, short-term project management, and long-term planning inform today's remediation decisions and the PCP currently in development. This work will continue to include engagement with the Project Team on implications of remediation on the location and timelines of a possible arsenic trioxide dust treatment and storage facility, and vice versa.

GMOB will continue to monitor pump reliability over the coming years and as the new water treatment plant becomes operational.



## ECONOMY

*The Economy section discusses planning, reporting, and outcomes related to the Project's economics. Specifically, this section focuses on economic benefits including employment and how well these benefits flow through to Yellowknife, surrounding communities, and Northerners generally. Social impacts are addressed in [Community Health and Well-being](#).*

### WHY IS THIS IMPORTANT?

Between 1948 and 2004, the Giant Mine was a major economic driver for the Yellowknife area and the Northwest Territories. When the mine stopped operating and Canada became the site custodian, attention focused on the environmental issues left behind.

In 2022, the Government of Canada determined that remediation of the site to the standards set by the MVEIRB and the MVLWB will cost Canada's taxpayers \$4.38 billion. The active remediation phase will span 30-plus years, with perpetual care required indefinitely. This makes GMRP one of the largest economic projects in the history of the Yellowknife area. It has the potential to buffer the upcoming losses from the closure of the diamond mines and help support the NWT economy, and potentially influence other remediation activities in the NWT expected over the next 10 to 20 years. With the Project now in the active remediation phase, the amount of work to be done has increased as have potential economic and employment opportunities for Northern residents. Increasing participation by resident labour and businesses will bring greater prosperity to Yellowknife and surrounding communities and set the NWT on a path for a stronger and more integrated economy in the future.

**Article 2.1 (d)** of the Agreement states that one of its key purposes is to "build public confidence in the Project and enhanced transparency and accountability in relation to the Project."

**Article 2.2 (a) (ii)** of the Agreement states that the Parties intend that the Agreement will achieve or support the remediation of the Giant Mine site in a manner that protects "the economy, way of life and well-being of the aboriginal peoples of Canada in the vicinity of Yellowknife, and of other residents of Yellowknife, the Northwest Territories and Canada."

The size and importance of the Project demands the flow of money to be closely monitored and accounted for by the governments of Canada and the NWT to ensure every opportunity for resident participation is taken. Likewise, GMOB believes the economic opportunities flowing from the Project require a similar level of attention from the Parties to the Agreement.

### WHAT DOES GMOB EXPECT?

**GMOB expects the remediation and post-remediation expenditures on the Giant Mine Remediation Project to create significant business, employment, and training opportunities for NWT residents,** including indirect and induced benefits (e.g., money spent by a contractor as part of its operations and consumer spending on

local goods and services by individuals working on the Project). In 2024 the Project Team released the *Giant Mine Remediation Project Socio-Economic Strategy: April 1, 2023 to March 31, 2028*,<sup>8</sup> which outlines the Project’s economic targets and approaches.

Per the Socio-Economic Strategy, the Project Team’s economic targets were established “through engagements with SEWG [Socio-Economic Working Group] and SEAB [Socio-Economic Advisory Board] in 2019-2020 [...] for select key performance indicators that encourage and drive performance and are more directly under the control or influence of the Project.” These targets include:

1. 65–75% of the dollar value of contracts to be awarded to Northern suppliers,
2. Northern workforce participation of 55%–70%, and
3. Northern Indigenous participation of 25–35%.

**GMOB expects the Project Team to use an *adaptive management approach***

as committed to in its Socio-Economic Strategy. In the Strategy, the Project describes the goal of adaptive management as a way to “address issues and risks that are resulting or may result in the GMRP being below or not meeting targets.” It states that “[a]s the Project tracks performance and reviews trends over time, it will proactively review if systems are functioning as intended and, where they are not, determine the causes and explore revised approaches toward achieving targets.” GMOB expects the Project Team to demonstrate how this approach is being applied, including what thresholds have been set and their associated management actions — i.e., how they plan to “adjust” based on its economic results (Diagram 1).

**Diagram 1. Example Adaptive Management Process** In environmental management, adaptive management typically follows a series of clearly defined steps that include pre-defined thresholds and planned responses. Here we provide an example adaptive management cycle, with the “Adjust” component — the primary weakness identified in this annual report — highlighted.<sup>9</sup>



**GMOB expects the Project Team to report its contracting and employment results on a quarterly and annual basis**, and to provide enough detail such that the Parties can assess the economic benefits of the Project to their respective communities and trends over time. When results fall short of targets, GMOB expects the Project Team will provide details on its strategies to reach those targets.

**GMOB expects the Project Team to increase local capacity through meaningful training opportunities.** To date, training outcomes have been reported as hours spent in training, and GMOB has raised concerns about the lack of transparency around those hours and how training funding is being spent. Details of interest include:

- the time spent in different education and training courses and programs, on- and off-site;
- how workers are reporting time in training; and,
- the number and types of training outcomes (e.g., certifications, course completions, etc.).

## WHAT ACTIONS WERE TAKEN?

The Project Team oversees the Socio-Economic Advisory Body and the Socio-Economic Working Group, having delegated them the responsibility for leading, coordinating, and integrating progressive socio-economic initiatives for the Project. The Socio-Economic Advisory Body and the Socio-Economic Working Group met throughout 2024. The focus of these meetings was the employment, contracting, and training opportunities and results of the Project.

In 2024, GMOB met with the following groups:

- City of Yellowknife to discuss its views on the opportunities and challenges presented by the GMRP, with some follow-up to discuss resident and business participation in the Project;
- Dechı̨ta Nàowō and subsequently the GNWT to better understand reported training results; and,
- GNWT officials to discuss how and the extent to which the territorial economy is benefiting from the GMRP and the strategies on growing those benefits over time.

## Adaptive management

The *Giant Mine Remediation Project Socio-Economic Strategy: April 1, 2023 to March 31, 2028* states that “the socio-economic aim of the Project to maximize socio-economic benefits for Northerners and Indigenous Peoples and to deliver on the regional socio-economic commitments and requirements supported through three pillars of focus, including employment and procurement, training and capacity development, and social impact management.”

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8 CIRNAC and GNWT. 2024. *Giant Mine Remediation Project Socio-Economic Strategy: April 1, 2023 to March 31, 2028*. <https://gmob.ca/wp-content/uploads/2024/04/GIANT-2023-Socio-Economic-Strategy-2023-2028-Low-Res-1.pdf>

9 Adaptive management cycle graphic adapted from West (2016).

In the Strategy, the Project commits to an **adaptive management approach** (see [What does GMOB expect?](#)). However, the Strategy does not outline a process with action-level thresholds and specific responses (i.e., how it will adjust), nor does it explain how adaptive management will be documented.

### ***Employment opportunities and procurement***

The GMRP created 259 jobs in 2023–24, equal to approximately 538,000 hours of work.<sup>10</sup> This is an increase from the previous fiscal year, 2022–23, when the total jobs number was 182 FTEs. Seventy-seven per cent of the jobs were located on-site, working for one of the many contractors employed by Parsons, the Main Contract Manager (MCM) for the Project. The remaining jobs were associated with contractors working directly for the Project Team (specifically CIRNAC).

Parsons hosted its annual “Industry Days” in November 17–18, 2024. The sessions were open to contractors wanting to learn about upcoming work packages and to learn about the rules, regulations, and procedures regarding the bidding and evaluation processes. The sessions were well attended.

In October 2023, GMOB submitted the report *GMRP Procurement and Contracting – Northern Contractor’s Experiences and Perspectives: Interviews Summary Findings Report*<sup>11</sup> to the Project Team. This report identified several weaknesses in the Project Team’s procurement and contracting approach, including contract de-bundling, weak communication, and southern contractors not meeting Indigenous hiring level requirements. In June 2024, the Project Team provided its responses<sup>12</sup> to the report’s eight recommendations (described in the following section).

The Project Team supplied GMOB with the labour and procurement data for the 2023–24 reporting year in October 2024. GMOB calculated the employment record for all Northern and Northern Indigenous labour to compare with the reported results. The outcomes of this work are provided below.

GMOB initiated a study into the Joint Venture partnerships that have formed to participate in GMRP work packages, by examining their information available on the public registry. GMOB’s objective is to gain a better understanding of the composition of Joint Venture partnerships and, in turn, infer the likelihood of economic benefits flowing to Northerners (both Indigenous and non-Indigenous). This work is ongoing.

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10 CIRNAC and GNWT. 2024. *Giant Mine Remediation Project Annual Report 2023–24*. 152 pp. <https://gmob.ca/wp-content/uploads/2025/01/2024-12-18-GMRP-Annual-Report-2023-2024.pdf>; presented in full-time equivalency (FTE), where one FTE job equals 2,080 hours.

11 Gaea Consulting Ltd. 2023. *GMRP Procurement and Contracting – Northern Contractor’s Experiences and Perspectives: Interviews Summary Findings Report*. Report submitted to GMOB. <https://gmob.ca/wp-content/uploads/2023/10/2023-10-04-GMOB-Report-GMRP-Procurement-and-Contracting-Report-F.pdf>

12 Giant Mine Remediation Project. 2024. *Responses to GMRP Procurement and Contracting Report*. <https://gmob.ca/wp-content/uploads/2024/08/2024-06-03-GMPR-letter-to-GMOB-Socio-Ec-report-October-9-2023.pdf>

## WHAT IS THE PROJECT'S PROCUREMENT APPROACH?

Per its [Socio-Economic Strategy](#),<sup>13</sup> the Project's employment and procurement objective is to "[m]aximize Indigenous and Northern participation through Northern and Indigenous-centered procurement processes, proactive communication of opportunities, and collaboration." Because the Government of Canada (CIRNAC) is a Co-Proponent of the Project, the Project must largely follow federal procurement regulations, policies, and guidelines, with some room for adjustment.

The Project applies Indigenous Opportunities Consideration (IOC) to procurement, which favourably weights proposals/bids that commit to Indigenous employment, training, and subcontracting. Bonuses and deductions are applied when contractors with IOCs do not meet their targets (e.g., bonuses for exceeding targets totalled \$156.11 and deductions for not meeting targets totalled \$175,676 in 2023–24).

The Project also applies the Government of Canada's Procurement Strategy for Indigenous Business (PSIB), which limits competition on certain contracts to qualified Indigenous businesses. To be eligible for these contracts, a business or organization must be at least 51% owned or controlled by one or more Indigenous persons.

### *Local capacity through training*

The Socio-Economic Advisory Body and the Socio-Economic Working Group met in 2024 with a focus on working to better understand the GMRP training record, in response to GMOB's concerns.

## WHAT WERE THE OUTCOMES OF THE ACTIONS?

### *Employment opportunities and procurement*

During the 2023–24 reporting period, Northern and Northern Indigenous businesses received 50% of Project contracts based on the total dollar value of expenditures, down from 61% in 2022–23. This drop was attributed to the \$242 million water treatment plant construction work package being awarded to a southern firm.

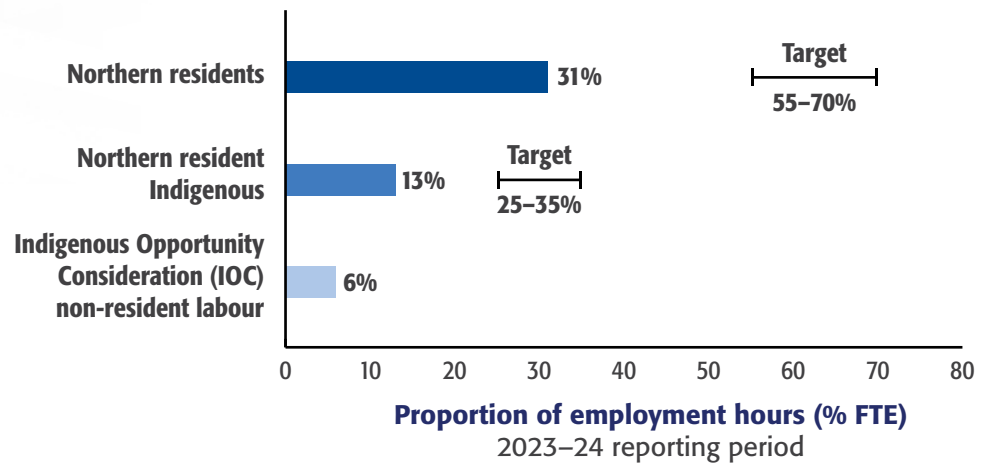
Per its 2023–24 Annual Report, the Project fell short of its employment targets for Northern and Northern Indigenous residents (Figure 1). However, the total employment increased from the previous year (an increase from 65 to 81 FTEs for Northern residents).

GMOB found through its analysis that approximately 34,100 employment hours over the 2023–24 reporting period (equal to 16.4 FTE jobs or 6% of the overall workforce) were incorrectly recorded as "Northern," rather than as Indigenous Opportunities Considerations (IOC) non-resident labour.<sup>14</sup> With this change, the actual participation rate for Northern residents was 31%, 13% of whom were Northern Indigenous residents.

<sup>13</sup> Per the Project's Socio-Economic Strategy: "because the Project is using the MCM model, there is some flexibility in procurement approaches" (page 3).

<sup>14</sup> Indigenous Opportunities Considerations (IOC) is a classification of labour based on Indigenous ethnicity and geographic location. Indigenous labour living within the contract area of the Project for at least six months qualifies as IOC.

**Figure 1.** Giant Mine Remediation Project employment targets and outcomes in the 2023–24 reporting period. Note: The Socio-Economic Strategy does not provide an employment target for IOC non-resident labour.



GMOB’s examination of publicly available Joint Venture records suggests that more businesses are forming Joint Ventures, making them eligible for PSIB procurement programs. As a result, the number of Indigenous-designated firms competing for contracts has risen over the past year. Moreover, the number of firms qualifying under the IOC rules and pre-qualifying for contracts has allowed the MCM to limit the competition to these firms exclusively under the federal government’s Regional PSIB. The financial details of these Joint Ventures are not shared with the public, so it is difficult to assess how they affect the NWT economy apart from their collective employment record, which is well below targets. GMOB will continue to monitor the growth of resident businesses and their participation in the Project.

### ***Adaptive management***

As described above, the Project failed to meet its employment targets for Northern residents and for Northern resident Indigenous. However, GMOB has not seen any evidence of adaptive management being triggered in response to under-performance relative to targets. The Project’s performance raises two key questions.

First, GMOB **questions whether the targets set in the Socio-Economic Strategy are appropriate.** For example, GMOB was told the decline in relative employment was expected: the total amount of work increased because of active remediation, so the proportion of Northern labour decreased. GMOB questions the rationale for setting an apparently unrealistic target (and notes that the rationale for the targets has not been clearly explained). GMOB has suggested that targets based on hours worked, measured as FTE jobs, may be more appropriate, resulting in more productive discussions on how to achieve incremental improvements in resident participation. With that said, GMOB accepts that the Parties to the Agreement did not want such a change.<sup>15</sup> GMOB notes that if the employment targets are not possible to achieve because there is insufficient qualified



Northern labour available, that should prompt larger-scale conversations at the Territorial level around capacity-building.

Second, the Project's **employment performance suggests an underlying issue with its strategy to achieve targets, which relies largely on procurement.** GMOB's exploration of Joint Venture partnerships has found that the number of Indigenous-designated firms competing for contracts has increased. However, the increase in Indigenous-designated firms has not been matched by a similar increase in Northern Indigenous employment. GMOB interprets these results to mean that the Project's strategy (a focus on procurement) is not enough to meet its targets (Northern and Indigenous employment). GMOB has seen no evidence that the Project is investigating this relationship or using local economic data to revise its approach to maximizing Northern and Indigenous employment.

Additionally, GMOB considers that the recommendations provided in both the *GMRP Procurement and Contracting – Northern Contractor's Experiences and Perspectives: Interviews Summary Findings Report* and previous GMOB Annual Reports as examples of opportunities for adaptive management. GMOB has not seen sufficient action on the part of the Project Team to address or investigate these concerns or the missed targets more generally that will bring about meaningful change.

### **Local capacity through training**

The Project Team shared detailed training data with the SEWG so that the members could undertake some analyses of the nature and effectiveness of the training initiatives. This exploration raised questions around the activities that had been reported as "training." GMOB and the working group members have since learned that reported training hours included such activities as daily safety "tailgate" meetings, which do not materially improve an individual's future career opportunities and can scarcely be considered "training," as the term is normally defined.

Further investigation into the data has revealed that most training hours fall into an "other" category, where the training taking place is unknown or not reported. It was also discovered that over 50% of the reported training hours were logged by individuals who had no recorded work hours with the Project. The training record did not include the number of certificates awarded nor the employment outcomes of training graduates. It is not clear how the training dollars being awarded are being spent, nor what the education outcomes are in relation to the dollar value of this public funding. GMOB will continue to engage with the Project Team on this topic and seek further clarification.

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15 The Project Team led a discussion on employment targets with members of the Socio-Economic Working Group. That group determined that it was not ready or willing to change the approach to employment targets or the target itself.

## **WHAT DOES GMOB OBSERVE?**

### ***Observation OBS-2024-4***

GMOB has yet to see the details of the Project Team's adaptive management process, including measurable thresholds and planned responses when those thresholds are triggered. Example responses could include adjusting targets (and reporting the data used to adjust them) and adopting new strategies for reaching targets.

### ***Observation OBS-2024-5***

The increase in Joint Ventures eligible for PSIB procurement programs has not been accompanied by similar increases in Northern and Northern Indigenous employment, both of which continue to fall short of targets.

### ***Observation OBS-2024-6***

"Training" has not been clearly defined and reported hours appear to be misrepresentative of legitimate training.

### ***Observation OBS-2024-7***

GMOB has highlighted several concerns regarding the Project's strategy for meeting its economic targets and its reporting. While these concerns stand, GMOB is also of the opinion that the Project has likely already hired as many people as it can from the North, given the current labour supply. The region's available labour force is limited by larger, systemic failures to improve employability of Northern residents and attract (and retain) workers. As the scale of the Project has increased, benefits to the Northwest Territories have fallen short as workforce limitations must be supplemented by southern labour. Nevertheless, the Project Team has opportunities to improve its communications and reporting, which would highlight the underlying issues affecting its employment outcomes to responsible government bodies.

## **WHAT ARE THE NEXT STEPS?**

The federal government's PSIB program prioritizes certain contracts for Indigenous-designated companies. Concerns have been raised nationally and locally<sup>16</sup> around the use of Joint Ventures to allow non-Indigenous firms to compete for government contracts or profit unfairly from them. The Project Team has confirmed that past PSIB contracts (including Joint Ventures) will be subject to financial audits during the next fiscal year. GMOB will continue to monitor this aspect of the Project and looks forward to seeing the results.

With the completion of the Socio-Economic Strategy, GMOB encourages the Project Team to develop an accompanying Socio-Economic Adaptive Management Plan (see **Observation OBS-2024-4**).

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16 Gaea Consulting Ltd. 2023. *GMRP Procurement and Contracting Northern Contractors' Experiences and Perspectives – Interviews Summary Findings Report*. Report submitted to Giant Mine Oversight Board. 13 pp. <https://gmob.ca/wp-content/uploads/2023/10/2023-10-04-GMOB-Report-GMRP-Procurement-and-Contracting-Report-F.pdf>



## COMMUNICATION, ENGAGEMENT, AND RECONCILIATION

*The Communication, Engagement, and Reconciliation section discusses communication efforts **between the Project Team, the Parties, GMOB, and the public**, as well as progress in the **ongoing process of reconciliation**. Communication is a theme that underlies all parts of this report, and this section brings it all together.*

### WHY IS THIS IMPORTANT?

The integrity and long-term success of the Project depends on successful communication, engagement, and reconciliation. If implemented successfully, they can 1) enable the Project Team, the Parties to the Agreement, GMOB, and the public to work together more effectively; 2) help ensure that the Project is well understood; and 3) help ensure the Project achieves its objectives.

**Effective communication and engagement** are critical for overcoming silos among the different components of the Project and among different parties affected by the Project. Engineering design plans, environmental monitoring, and project management and planning during active remediation have profound implications for the Project's economic and social impacts, the eventual implementation of a permanent solution to the arsenic trioxide dust, and long-term planning (including the PCP, land-use planning, and acute arsenic risk communications). GMOB expects engagement to go beyond a one-way transfer of information, but rather to be meaningful opportunities to provide feedback, and have that feedback considered, before, during, and after decisions are made.

As concluded by the Truth and Reconciliation Commission, **reconciliation** requires "an ongoing process of establishing and maintaining respectful relationships<sup>17</sup>" between Indigenous and non-Indigenous peoples. It requires true, genuine, and meaningful engagement. Since it was first developed, Giant Mine has been a major point of contention between the local Indigenous peoples, the Government of Canada, the mine operators, some local residents, and to a lesser degree, the GNWT. Reconciliation between Indigenous peoples and governments regarding the harms caused by the Giant Mine is an ongoing process. This process includes (but is not limited to) federal responses to requests for an apology and compensation, opportunities for Indigenous businesses, and improved communications and engagement regarding the entire remediation process (including post-closure).

The Parties to the Environmental Agreement include specific communities: Yellowknives Dene First Nation, North Slave Métis Alliance, and the City of Yellowknife and its residents. The GNWT represents the interests of NWT residents, and Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) represents the interests of the Canadian public. Together, these Parties must be informed and engaged about the activities on the Giant Mine site and plans for the near and distant future.

**Articles 2.1 (c) and (d)** of the Agreement state that the purpose of the Agreement is to "facilitate collaboration among the Parties" and "build public confidence in the Project

and enhanced transparency and accountability in relation to the Project.” **Article 2.2 (e)** also states that the Parties intend that the Agreement will achieve or support “effective communication with future generations.”

**Section 3.1 (b) (ii)** of the Agreement states that GMOB may compile and analyze available and environmental quality data in order to review, report, or make recommendations concerning “the Project’s integration of Traditional Knowledge into its Environmental Program and Plans.”

### **WHAT DOES GMOB EXPECT?**

**GMOB expects both the Project Team and the Parties to continue to engage meaningfully with the Project, the public, and one another.** Meaningful engagement requires continued efforts by all Parties to hear, to share, and to build mutual respect, trust and understanding. Without these efforts toward full engagement by all Parties, the Project will not reach its maximum potential benefit — environmental, economic, cultural, and social — and will fall short of achieving the principles of reconciliation.

**GMOB expects the Project Team to clearly and accessibly communicate the following information** with the Parties, GMOB, and the public, and to provide meaningful opportunities for questions and input:

- Remediation plans, activities, and events (e.g., spills or failures) that will directly or indirectly affect nearby communities and groups.
- Remediation plans and activities that will directly or indirectly affect perpetual care considerations and the PCP, land-use planning, and implementation of a permanent solution for the arsenic trioxide dust.
- The Project’s economic impacts, including Northern and Northern Indigenous employment and training.
- Which parts of the site will be remediated, which will not, and arsenic exposure risks (including acute exposure risks) both on- and off-site.
- The status of the apology and compensation for the Yellowknives Dene First Nation.
- Contingency plans for emergency events such as a wildfire evacuation.

### **WHAT ACTIONS WERE TAKEN?**

GMOB undertakes a range of activities related to communication and engagement, including meeting with the Project Team and Parties, providing information to the public, conducting media sessions, and keeping its website and archive up to date. In 2024, GMOB (directors and staff) attended 147 meetings and engagement sessions. For a full summary of GMOB’s activities in 2024, see [Appendix B](#).

One of GMOB’s responsibilities, and that of the Parties (not including CIRNAC and the GNWT), is to review the Project Team’s submissions to the MVLWB and provide comment. Table 1 provides a summary of Party comments on MVLWB submissions, as well as GMOB’s, in 2024.

**Table 1.** Reviews submitted by the Parties (not including CIRNAC and the GNWT, who are Co-Proponents of the Project) and GMOB on Project Team submissions to the MVLWB in 2024.

SUBMISSION	YKDFN	NSMA	ALTERNATIVES NORTH	CITY OF YELLOWKNIFE	GMOB
2023 Aquatic Effects Monitoring Program Annual Report				×	×
2023 Water Licence Annual Report					×
Borrow Design Plan, Version 1.1					×
Open Pits Design Plan Version 1.0				×	×
Water Management and Monitoring Plan Version 5.0				×	×
Erosion and Sediment MMP, Version 3.0			×	×	×
Annex A SNP Proposed Updates					×
2024 Aquatic Effects Monitoring Program Re-evaluation Report			×		×
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>8</b>

Reconciliation with the Indigenous communities that were and are negatively affected by the historic operations at Giant Mine is an ongoing process. In 2021, CIRNAC and YKDFN began meeting to discuss an apology and negotiate compensation, in response to repeated requests and a petition by YKDFN to the House of Commons.<sup>18</sup> GMOB is unaware of the current status of these negotiations as of 2024.

The Project has also adopted procurement processes (PSIB, IOC) as strategies that support economic reconciliation. However, GMOB has concerns that the current indicators and targets do not provide a reasonable picture of the economic benefits that are flowing from the Project to Northern Indigenous communities (see [Economy](#) for more information).

Multi-Party working groups meet several times a year. The purpose of these meetings is for the Project Team and Party representatives to share information, express views and concerns, and be heard. A list of multi-Party working groups, and the number of times they met in 2024, is provided in Figure 2.

<sup>18</sup> A response from CIRNAC to these requests was recommended in GMOB's annual reports from 2016 to 2019

Technical working sessions and public meetings have increasingly returned to in-person events where possible, but virtual attendance has continued in some cases when individuals have the option to attend in person. GMOB cautions that virtual attendance may be both a result of, and lead to, less meaningful engagement where in-person attendance is feasible. GMOB encourages all parties to ensure continued meaningful engagement at meetings, including in-person attendance whenever possible.

The Project Team shared information about its remediation activities through in-person and online public meetings, public service announcements, electronic newsletters, media briefings, and social media postings. The federal government and the GNWT maintain and update Project-related information on their respective websites. The Project Team hosted or participated in 31 engagement activities and events in 2023–24, citing the wildfire evacuations as the reason for reduced engagement compared to previous years (e.g., 78 activities in 2022–23, 87 in 2020–21, and 67 in 2019–20).

The independent Yellowknife Health Effects Monitoring Program (YKHEMP) has continued to communicate the results of its phase two research, mainly through radio announcements and brochures. The Project Team made some (albeit limited) progress in engaging the boating public through a targeted information session in October 2024. For more information on these topics, see [Community Health and Well-being](#).

## WHAT WERE THE OUTCOMES OF THE ACTIONS?

As noted above, GMOB is concerned about the quality and effectiveness of communication and engagement activities. While working groups continue to meet, the number of meetings has notably decreased in some cases. For example, the GMWG met only four times in 2024, compared with eight meetings in 2022, reducing opportunities for GMOB and the Parties to engage on impactful decisions, such as closure of the underground. GMOB has observed a trend over time toward reduced feedback from some Parties (e.g., Table 1) and the absence of subject matter experts in some circumstances (e.g., experts in social impacts, economics, or climate change). GMOB also notes a reduction (more than 50%) in public engagement activities or events in 2023–24, which the Project attributed to the 2.5-month wildfire evacuations, and will be monitoring closely to see if engagement returns to pre-evacuation levels.

**Table 2** summarizes expected communications, provides concrete examples of communications in 2024, and describes GMOB's evaluation of the effectiveness of communication efforts. As evident in this summary, GMOB has concerns around the clarity and accessibility of important information, particularly when it comes to sharing information with the public. GMOB notes the GMRP has developed an Engagement Evaluation Plan but has not seen the results of any of the planned evaluations.

**Table 2.** Summary of expected communications, examples from 2024, and GMOB’s assessment of their effectiveness. Many of these topics are discussed in more detail in other sections of this Annual Report, and links to these sections are provided.

EXPECTED COMMUNICATION			
Remediation plans, activities, and events (e.g., spills or failures) that will directly or indirectly affect nearby communities and groups.			
EXAMPLES	HOW WAS THIS COMMUNICATED?	WAS COMMUNICATION EFFECTIVE?	SEE ALSO
Upcoming boat launch closures.	One dedicated engagement session in 2024.	The engagement session was poorly attended and had low representation by the boating public.	Community Health and Well-being
Repeated failures of backup submersible pump.	Pump failures and progress in repairs/replacement were shared during working group meetings.  A timeline of pump failures was shared at a working group meeting in 2023.	Information regarding pump failures was shared periodically during working group meetings. However, there was a lack of clarity around the status of backup pumps and repairs, including why the shelf spare was in Leduc. The Project Team no longer maintains a shelf spare, and this decision has not been explained.	Environment
Updated AEMP	The draft updated AEMP was expected in 2024. It has not been shared.	GMOB, the Parties, and other affected community members have not yet had the opportunity to meaningfully engage with the draft AEMP. Delays in sharing the draft will result in a shorter pre-engagement period and a potentially less rigorous review.	Environment

**Table 2.**

<b>EXPECTED COMMUNICATION</b>			
Remediation activities and decisions that will directly or indirectly affect perpetual care considerations and the PCP, land-use planning, and implementation of a permanent solution for the arsenic trioxide dust.			
<b>EXAMPLES</b>	<b>HOW WAS THIS COMMUNICATED?</b>	<b>WAS COMMUNICATION EFFECTIVE?</b>	<b>SEE ALSO</b>
Closure of the underground.	The decision to close the underground and details of a long-term portal were shared as part of other updates during working group meetings. The decision was not shared with the public until closure was completed.	Some Parties and the public were surprised to learn of the closure. There was no dedicated public communication on this topic and no opportunity to ask questions or raise concerns before it was done.	Project Management and Planning
One third of the site will not be remediated.	GMOB, the Parties and the Working Groups are aware.	To date, GMOB feels it has not been clearly and explicitly communicated to the public, nor have implications for future land-use planning and arsenic exposure risks.	Long-term Planning
The underground arsenic trioxide dust has been covered with cemented paste backfill.	This information was included in the underground design plan. GMOB provided comments on this plan.	The decision to “cap” the arsenic trioxide dust with cement has implications for extracting the dust for the eventual implementation of a permanent solution. These implications are as yet unclear.	Project Management and Planning GMOB Research Program
Contaminated waste disposal in B1 pit, Chamber 15, and the nonhazardous waste pit.	Decisions to dispose of contaminated waste from the site, including the roaster, were shared during working group meetings.	GMOB has unanswered questions regarding the long-term implications of these plans for perpetual care, including whether the roaster waste will be cleaned of arsenic trioxide dust prior to disposal.	Project Management and Planning

**Table 2.**

EXPECTED COMMUNICATION			
The Project's economic impacts, including Northern and Northern Indigenous employment and training.			
EXAMPLES	HOW WAS THIS COMMUNICATED?	WAS COMMUNICATION EFFECTIVE?	SEE ALSO
What financial benefits are flowing from the Project to Northern and Northern Indigenous communities	The Project Team uses employment targets (%FTE) and procurement processes (PSIB and IOC) as its primary strategy for retaining economic benefits from the Project in the North. Outcomes are provided in its Annual Report.	GMOB's concerns with reporting include 1) lack of transparency around rationale for targets; 2) lack of clarity how or whether adaptive management will be applied given targets were not met; and 3) indicators do not clearly illustrate which economic benefits flow into Northern and Northern Indigenous communities.	Economy

EXPECTED COMMUNICATION			
Status of the apology and compensation for the Yellowknives Dene First Nation.			
EXAMPLES	HOW WAS THIS COMMUNICATED?	WAS COMMUNICATION EFFECTIVE?	SEE ALSO
Status update.	Neither CIRNAC nor YKDFN have shared the current status of negotiations toward an apology and compensation in 2024.	No.	

EXPECTED COMMUNICATION			
Contingency plans for emergency events such as a wildfire evacuation.			
EXAMPLES	HOW WAS THIS COMMUNICATED?	WAS COMMUNICATION EFFECTIVE?	SEE ALSO
Contingency plan.	The Project's Spill Contingency Plan has been broadened to be an <a href="#">Emergency Management and Spill Response Plan (EMSRP)</a> . The EMSRP now includes sections on site evacuation and wildfire. An Incident Action Plan for a wildfire event is included in an appendix to the EMSRP.	The updated EMSRP is available to the public online.	Environment

**Table 2.**

<b>EXPECTED COMMUNICATION</b>			
Which parts of the site will be remediated, which will not, and arsenic exposure risks (including acute exposure risks) both on- and off-site.			
<b>EXAMPLES</b>	<b>HOW WAS THIS COMMUNICATED?</b>	<b>WAS COMMUNICATION EFFECTIVE?</b>	<b>SEE ALSO</b>
Post-closure land-use constraints map.	The post-closure land-use constraints map was provided to the City of Yellowknife and GMOB but is not publicly available. The map outlines areas in the following broad categories: 1) No access and no development; 2) Restricted access and no development; 3) Access permitted and restricted development; and 4) Access and development permitted	It is GMOB's position that constraints to future land uses are a matter of public interest and should be shared with the public.	Long-term Planning
Acute arsenic exposure risk to a toddler that eats a small amount of soil	The risk assessment approach used by the Project did not take into account the possibility of an average toddler eating a small amount of soil and being exposed to dangerous levels of arsenic in some parts of the site. A supplemental risk evaluation is in progress and development of appropriate risk messaging is anticipated.	The degree of acute exposure risk to a toddler in certain parts of the site have not been fully assessed and communicated to the public, nor have high-risk areas been mapped.	Community Health and Well-being
Overall arsenic exposure risks	There are 24 small warning signs along the road through the Project site, in addition to two information and nine regulatory signs (see Box 6). All signs are in English and French. The site is easily accessed by road and is immediately next to both the public boat launch and the Ingraham Trail recreational area entrance. There is no signage at Ingraham Trail or at the turnoff indicating that the area is contaminated or recommending appropriate precautions.	GMOB has concerns around the visibility and legibility of the signs from the road, and the lack of signs translated to Willideh. Information and warning signs along the road do not use universal symbols that convey risk or danger to non-English or French speakers.	See next page





**Regulatory signs:** There are nine regulatory signs, located primarily along the shoreline of Back Bay. Image courtesy of the Project Team.



Photos a) and b) **Information signs:** There are two information signs, located at the site entrance and the public boat launch. Sign (a) was photographed from the road at the Project site entrance on Feb. 3, 2025. Photo of Sign (b) courtesy of the Project Team.



Photo c) **Warning signs:** There are 24 information signs, located the site entrance and along the Northwest Tailings Containment Area. This sign was photographed from the road at the Northwest Tailings Containment Area on Feb. 3, 2025.

## **WHAT DOES GMOB OBSERVE?**

### ***Observation OBS-2024-8***

GMOB observes that according to MVLWB records, none of the Parties to the Environmental Agreement (excluding the GNWT and CIRNAC) commented on all Project Team submissions to the MVLWB in 2024 and two of the Parties (YKDFN and NSMA) did not comment on any of the submissions. While GMOB has commented on all submissions, it notes that it does so through its own lens and does not speak for or on behalf of any of the Parties in its responses.

### ***Observation OBS-2024-9***

GMOB is unaware of any status updates from CIRNAC and YKDFN regarding the apology and compensation process with the Yellowknives Dene First Nation and is thus unable to comment on the progress of this step toward reconciliation.

### ***Observation OBS-2024-10***

Communication and engagement are important weaknesses of the Project to date. GMOB continues to observe a lack of meaningful engagement opportunities (i.e., opportunities to provide input before decisions are made, and with the potential to affect decisions). There is a need for strong steps to improve communication, both 1) among the Project Team, the Parties, and GMOB, and 2) with the public.

## WHAT ARE THE NEXT STEPS?

GMOB is committed to encouraging effective communication and engagement on Project environmental, engineering, health, safety, and economic matters. As outlined in Table 2, there have been notable communication breakdowns that highlight how siloed the different components of the Project have become, and a decline in opportunities for parties to have their input considered by the Project Team before, during, and after decisions are made.

As an important next step, GMOB encourages the Project Team to strengthen its overall communications approach by evaluating the effectiveness of its communication and reconciliation efforts to date. Are the people and parties who need information receiving it in a clear, accessible, and timely way? Are there meaningful opportunities to ask questions, provide input, and see their input addressed? Are engagement opportunities treated as a one-way imparting of information, or as an opportunity for back-and-forth? Are economic benefits flowing to Northern Indigenous communities as a result of the Project Team's procurement and employment policies?

These questions and more need to be closely and critically examined in order to identify opportunities for improvement.

Importantly, GMOB recognizes that while many of the communication breakdowns identified in this section are attributed to the Project Team, there is room for all involved (including GMOB and the Parties) to improve communication. **Effective engagement requires that all parties show up to the table ready to talk and to embrace an integrated, rather than a siloed, approach to the Project.** GMOB remains committed to enhancing its capacity to oversee communication and engagement activities and monitor outcomes and trends.

## PROJECT MANAGEMENT AND PLANNING

*The Project Management and Planning section discusses the Project's **daily activities and planning (e.g., climate change planning)** that relate to active remediation, which is scheduled to be completed in 2038. This section highlights many cross-topic implications, including long-term planning connections, which are discussed in more detail throughout this report.*

### WHY IS THIS IMPORTANT?

The Project is a multi-year, multi-billion-dollar endeavor. The Project Team's primary goal is to protect human health and safety and the environment. Planning the work and activity on the site must account for varying levels of arsenic trioxide contamination. Effective project management and planning is critical to keeping a project of this size and complexity under control, with respect to schedule, cost, and outcomes.

**Today's project management and planning lay the groundwork for the Project area's future.** Engineering decisions may facilitate or complicate the eventual implementation of a permanent solution to the arsenic trioxide dust buried underground. The choice of soil reclamation standards and where they are applied will affect future land-uses and risk communication — importantly, one third of the site will not be remediated, including soils in those areas. These decisions and more have implications for perpetual care and will thus affect the development of the PCP. Decisions that have direct bearing on the post-closure period (i.e., after 2038) will fall under the PCP and are discussed in [Long-term Planning](#).

**Climate change models** allow the Project Team to engineer designs that are robust to not only today's conditions but also expected future conditions under climate change, for example through mitigation and adaptation. These considerations are particularly important in the NWT, where warming is occurring roughly three to four times faster than the global average.<sup>19</sup>

Climate change modelling requires a wide range of decisions, including what data to use, what assumptions are made, how conservative to be, how far in the future to look, and more. Climate science is constantly evolving as data and models improve, and the results of climate models can be influenced by the decisions around how they are built. Effective climate modelling to inform design assumptions is important not only from an environmental perspective, but also from an economic perspective, as it is costly to go in and re-do engineering if it is not well-suited to eventual climate conditions and extreme events (e.g., wildfire or flooding).

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<sup>19</sup> GNWT. 2022. 2.0 Driving Force – Climate Change. In: NWT State of the Environment Report. Yellowknife, NWT. <https://www.gov.nt.ca/ecc/en/services/nwt-state-environment-report/20-driving-force-climate-change>

**Section 2.2** of the Agreement states that the Parties intend that the Agreement achieve or support the following objectives:

1. the remediation of the Giant Mine site in a manner that protects the land, air, water, aquatic life, and other wildlife in the area of, or potentially affected by the Project;
2. the remediation of the Giant Mine site in a manner that eliminates or substantially mitigates the environmental risks posed by the site;
3. comprehensive, integrated ecosystem-based approaches for the monitoring, management, and regulation of the Project; and,
4. the minimization of the Perpetual Care requirements at the Giant Mine site.

**Section 3.1 (b) (v)** states that in furtherance of its mandate, the GMOB may compile and analyze available and relevant environmental quality data to review, report, or make recommendations concerning “environmental or engineering studies conducted by the Co-Proponents in relation to the Project.”

## **WHAT DOES GMOB EXPECT?**

**GMOB expects continuous improvement by the Project Team in implementing the Project.** GMOB expects the Project Team to modify work plans and engineering based on monitoring results, adaptive management practices, and new information brought forth by external researchers, community members, and others. This includes the impacts of climate change on the Project and impacts of the Project on climate change (e.g., GHG emissions).

**GMOB expects the Project Team to take an integrated approach to project management and planning.** Decisions made during active remediation impact every other topic described in this Annual Report, and risk unintended consequences if these impacts are not carefully considered and communicated to GMOB, the Parties, and the public. Examples include:

- the Project’s economic impacts (e.g., procurement, training, and contractor management);
- impacts to the community well-being through significant closures (e.g., boat launch closures);
- remediation and engineering decisions that have implications for the eventual implementation of a permanent solution to the arsenic trioxide dust stored underground;
- activities with implications for the burden of perpetual care and the scope of the PCP (e.g., contaminated waste disposal), land-use planning, and acute arsenic exposure risk; and
- plans based on climate-change modelling that may not sufficiently account for the risk of extreme events in the longer-term.

**GMOB expects the Project Team to ensure that all interested parties are aware of remediation plans, opportunities, and potential impacts.** Continuous improvements to the Project depend in part on the Project Team being responsive to new information and input from both experts and the community. Quality input from affected parties is possible only when information is communicated in a timely, accessible manner, with opportunities for a two-way flow of information. This topic is covered in more detail in [Communication, Engagement, and Reconciliation](#).

**GMOB expects the Project Team's designs to consider and incorporate the results of GMOB's ongoing research toward a permanent solution for the arsenic trioxide dust stored in the underground chambers** (see [GMOB Research Program](#) for more information). The temporary nature of freezing the arsenic trioxide dust in underground chambers and the search for a permanent solution need to be considered in designs so remediation work does not compromise the eventual implementation of a permanent solution. GMOB expects that the Project Team and GMOB will work closely together to achieve the following goals:

- the Project Team is aware of research developments and their implications for site remediation;
- GMOB is aware of any Project Team's plans or work that have implications for the development and implementation of a permanent solution; and,
- the Project Team ensures continued access to the underground and shares details regarding access procedures and timelines.

**GMOB expects the completed post-closure land-use constraints map to inform land-use planning, short-term project management, and perpetual care.** This map indicates the expected future use opportunities of the site under four broad categories according to the site's future risk:

1. No access and no development
2. Restricted access and no development
3. Access permitted and restricted development
4. Access and development permitted

Note: The map does *not* indicate which parts of the Project area will be remediated and which will not, nor does it indicate soil arsenic concentrations. Instead, it indicates which areas will be available for access or development according to health risks post-remediation. GMOB expects to see more details regarding which areas will be remediated as part of the Contaminated Soil Design Plan (anticipated submission to the MVLWB in 2025).

**GMOB expects the potential location of any arsenic trioxide dust treatment and storage facility infrastructure to be factored into longer-term plans, including the PCP.** These considerations become increasingly important as active remediation progresses and as the GMOB research program advances research on vitrification.



**GMOB expects to continue to meet with the Project Team at least twice a year to share and discuss all relevant Project information and GMOB's work and research.** These meetings are in addition to the existing semi-annual meetings with the Parties.

#### **WHAT ACTIONS WERE TAKEN?**

Active remediation continues. The Project Team has reported that it is **on budget and largely on schedule**. Notable exceptions include delays of the draft AEMP, which was expected to be shared for pre-engagement in 2024, and the PCP, on which work has begun more than five years behind schedule.

Active remediation requires the submission of various management and monitoring, design, and construction plans to the MVLWB. The Project Team submitted the required plans and ensured that the site remained stable and posed no significant environmental or safety risks in 2024 (see [Environment](#) for more information). Ongoing activities include construction of the new water treatment plant, developing an updated AEMP, and continued care and maintenance activities.

The underground was sealed (or "closed") in 2024, meaning it will be monitored remotely moving forward. GMOB is aware that a long-term access portal is scheduled for construction in 2026.

The closure of the underground includes the removal of access for direct physical sampling and monitoring of the underground. Crown pillar stability over the arsenic stopes will be monitored using extensometers installed in the crown pillars as well as through borehole camera surveys. Mine water level monitoring will be conducted using sensors in the two submersible pumps feeding the water treatment system as well as three additional sensors to be installed in boreholes in the vicinity of the B1, C1 and B4 areas. Mine water quality will be monitored from samples collected on the surface, at the new water treatment plant.

In addition, the chambers containing the arsenic trioxide dust have been backfilled with cemented paste, meaning the surface of the dust has been "capped" with cement. Capping the dust may have implications for the dust's eventual extraction for implementing a permanent solution, but those implications are as yet unclear.

The Project Team has the following plans for disposing of contaminated waste:

- Waste from the roaster, which is contaminated with arsenic trioxide dust and demolition debris, will be deposited into Chamber 15 and frozen. It is not clear whether any of this contaminated waste will be kept separate from other waste or rinsed before disposal.
- Additional arsenic-contaminated waste material (e.g., material generated during roaster decommissioning) will be disposed into the B1 pit and frozen.
- Arsenic-containing sludge from the new water treatment plant will be disposed in a cell in the non-hazardous waste landfill.

The Project Team continues to plan boat launch closures per the following timelines:

- **July 2028 to May 2030:** The Sailing Club site will be closed for remediation. The existing public boat launch will remain open and be shared by the public and the Sailing Club.
- **May 2030 to June 2038:** The current public boat launch and parking lot will be closed for remediation. The Sailing Club will re-open as the “interim public launch,” where two ramps will be shared by the Sailing Club and the public. Per the GMRP Annual Report (2023–24), remediation activities will include construction of the new water treatment plant, outfall installation, freshwater intake-water, and water trucks for on-site dust management.

These activities will result in the entire boating public sharing a single boat launch for a minimum of 10 years, and GMOB is unaware of a plan or communications related to sailboat storage. For more information on the plan, its communication, and its expected impacts to the boating public, see [Community Health and Well-being](#).

### ***Climate change planning***

Both the Project Team and the Parties increased their engagement on the subject of GHG emissions and climate change in 2024. The Project Team continues to track and report GHG emissions from site activities, as recommended by GMOB in 2019 (recommendation 2019-9). The Project Team also provided more information on the assumptions it is using in its designs (e.g., temperature and precipitation projections), as requested by GMOB and other parties.

In 2023, GMOB contracted RFS Energy Consulting & Research Group to conduct a high-level review of the *Giant Mine Remediation Climate Change Report*.<sup>20</sup> The GMOB report, *Giant Mine Remediation Project – Climate Change Report Review (Summary Report and Recommendations)*,<sup>21</sup> provided short- and long-term recommendations to make climate change considerations and strategies “more clear, robust and transparent.” The Project Team provided a response to GMOB and other party comments in 2024.<sup>22</sup>

On October 31, 2024, GMOB submitted its review comments on the WSP report, *GMRP Climate Change: Sixth Assessment Report Projections*, to the Project. The Project has said that it will respond formally to the comments in the spring of 2025.

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20 Golder Associates Ltd. 2020. *Giant Mine Remediation Project – Climate Change*. Report submitted to Public Services and Procurement Canada. Edmonton, AB. 119 pp.

21 RFS Energy Consulting. 2023. *Giant Mine Remediation Project – Climate Change Report Review; Summary Report & Recommendations*. Report submitted to Giant Mine Oversight Board. 23 pp. <https://gmob.ca/wp-content/uploads/2023/10/2023-10-01-GMRP-Climate-Change-Report-Summary-Recommendations-RFS-Energy-2023-F.pdf>

22 Giant Mine Remediation Project. 2024. *GMRP Response to Comments on the Giant Mine Remediation Project’s Climate Projection Report (Golder 2020)*. 10 pp. <https://gmob.ca/wp-content/uploads/2024/05/GMRP-Climate-Change-Response-and-Cover-Letter-Signed-8MAY2024.pdf>



## WHAT WERE THE OUTCOMES OF THE ACTIONS?

The major engineering decisions described above have implications for the GMOB research program, long-term planning and the PCP.

The implications of the **closure of the underground**, and procedures for accessing the underground in the future, are unclear. GMOB is aware of plans to construct a long-term access portal with a lockable entry point. Safety stations have been removed and GMOB expects they would need to be re-established in the event of re-entry. While plans for monitoring mine water quality and levels have been shared, GMOB is unaware how the Project Team plans to access the chambers for maintenance activities (e.g., scaling to check for loose rocks), mine inspections (if mine inspections are required, which is also unclear), or to respond to emergencies.

Both **closing the underground and backfilling the chambers that contain arsenic trioxide dust** have implications for the eventual implementation of a permanent solution. GMOB is currently unaware of the timelines, protocols, equipment, or other considerations necessary for re-entry, including re-entry to extract the dust (see [GMOB Research Program](#) for more information).

The **planned disposal of arsenic-contaminated waste and debris in Chamber 15 and the B1 pit** has implications for both perpetual care and the GMOB Research Program. The goal of the GMOB research program is to substantially reduce the burden for perpetual care and the degree of risk by stabilizing the arsenic trioxide dust. If these materials are dumped underground, any arsenic trioxide dust intermingled with the debris will be significantly more difficult to extract for treatment. It is currently unclear whether the Project Team intends to rinse or separate the contaminated waste before or during disposal. While GMOB does not dispute the safety of freezing contaminated waste underground, it maintains that implications for perpetual care and the research program warranted targeted engagement and opportunities for input, including consideration of other opportunities.

The **planned disposal of arsenic-containing sludge in the non-hazardous waste landfill** initially raised concerns, but GMOB has confirmed that the plan is within disposal guidelines<sup>23</sup> and that the actual arsenic in the leachate from this sludge is currently well below the hazardous threshold. GMOB will closely monitor arsenic leachate concentrations once this plan is implemented.

However, GMOB maintains that the above activities have clear implications for long-term care of the site, and activities that increase long-term care needs should be minimized and avoided wherever possible.

Implications of the scheduled boat launch closures are discussed in [Community Health and Well-being](#).

Concerns regarding the communication around these decisions are outlined in [Communication, Engagement, and Reconciliation](#).

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23 GNWT. 2017. *Guidelines for Hazardous Waste Management (Revised October 2017)*. Environment Division, Dept. of Environment and Natural Resources, Government of the Northwest Territories. 52 pp. [https://www.gov.nt.ca/ecc/sites/ecc/files/resources/128-hazardous\\_waste-interactive\\_web\\_0\\_0.pdf](https://www.gov.nt.ca/ecc/sites/ecc/files/resources/128-hazardous_waste-interactive_web_0_0.pdf)

### *Climate change planning*

In its response to the GMOB report *Giant Mine Remediation Project – Climate Change Report Review (Summary Report and Recommendations)*, the Project Team largely declined to adopt GMOB’s recommendations. The Project Team’s responses to the recommendations broadly fell under the following themes:

- **disagreeing with the necessity of recommendations;** for example, suggesting that a technical climate change report is not the appropriate location to incorporate Traditional Knowledge;
- **agreeing with the recommendation but maintaining that it is already met;** for example, by stating that its staff and consulting engineers already have the necessary level of climate expertise; and,
- **vague commitments;** for example, “[t]he GMRP has committed to include more information on climate assumptions in forthcoming design plans.”

The Project Team noted that as part of its climate continual improvement process, it had contracted two reports<sup>24</sup> that examined the implications of the IPCC’s Sixth Assessment Report’s (AR6) updates.<sup>25</sup> GMOB submitted questions regarding the absence of site-specific data, limited “extreme” event projections, the limited time horizon of the models (i.e., not looking beyond 100 years), and how these and other considerations affect the Project’s design assumptions. For example, there is no mention of wildfire in either report. GMOB expects a response from the Project Team in the spring of 2025.

### **WHAT DOES GMOB OBSERVE?**

#### *Observation OBS-2024-11*

GMOB is concerned by what it considers a “siloe” approach to project management and planning. Several plans and activities are underway with important consequences that appear to have been either overlooked or poorly communicated, apparently because they are not directly relevant to the engineering considerations of the active remediation period. Closing the underground, backfilling the arsenic trioxide dust, the scheduled boat launch remediation, and climate change projections have long-term and social impacts. GMOB looks forward to discussing these concerns with the Project Team and identifying opportunities for a more integrated approach to the Project.

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24 WSP (WSP Canada Inc.). 2024a. *Giant Mine Remediation Project. Draft: Climate Change: AR6 Projections*. Reference No. 18102211-034-R-Rev1-38000; WSP. 2024b. *Giant Mine Remediation Project. Draft: Review of AR6 Projections and Recommendations for Closure Designs*. Reference No. 18102211-795-TM-RevA.

25 IPCC (Intergovernmental Panel on Climate Change). 2025. *Sixth Assessment Report*. <https://www.ipcc.ch/assessment-report/ar6/>

## **WHAT ARE THE NEXT STEPS?**

GMOB will continue to review and comment on plans and reports required by the MVLWB.

GMOB looks forward to engaging with the Project Team regarding the implications of closing the underground and other key decisions being planned (e.g., hazardous waste disposal). GMOB will request information including protocols for underground re-entry, assessment of project decisions against perpetual care and research program requirements, and the Project's risk management plan.

GMOB will continue to be engaged on the topics of climate change and GHG emissions, including reviewing the adequacy of the Project Team's planning under likely climate change scenarios.

## COMMUNITY HEALTH AND WELL-BEING

*The Community Health and Well-being section discusses the **known, suspected, and anticipated social and health impacts** of environmental contamination, Project activities and plans, and post-closure plans (e.g., the PCP).*

### WHY IS THIS IMPORTANT?

The site of the former Giant Mine has 237,000 tonnes of arsenic trioxide dust temporarily stored underground. There is widespread surface contamination on and off the site. Residents are understandably concerned about arsenic and other unsafe elements in soil, tailings, dust, surface water and groundwater, and flora and fauna in the area. A significant portion of the site will not be remediated, including highly contaminated areas. The health risks associated with these contaminated areas have important implications for land-use planning and risk communication.

As the Project enters active remediation, the footprint and intensity of activities has increased. These activities have the potential to produce additional social impacts that affect the health and well-being of residents. Unlike the economic results of the Project, which may be presented as dollars and percentages, social impacts are more qualitative and include non-monetary benefits and risks. Examples of activities that will have a social impact include a growing workforce, much of which may be temporary, and activities resulting in access restrictions (e.g., to the public boat launch).

Boat launch closures due to remediation and reconstruction from 2028–2038 are an example of a foreseeable and important social impact on the community. The remediation activities will impact the boating public, the Great Slave Sailing Club, the Great Slave Lake Yacht Club, and the Yellowknife Historical Society. Two boat launches and parking areas (the public boat launch and the Sailing Club boat launch) currently serve the boating community (Figure 3A). The Project Team's plan is for all boaters to first share the public launch for lake access while the Sailing Club launch (including the marina) is remediated, then to share an interim public launch at the Sailing Club while the public launch is remediated. **These closures will have the combined boating community (boating public and Sailing Club) sharing a single launch site for a minimum of 10 years:**

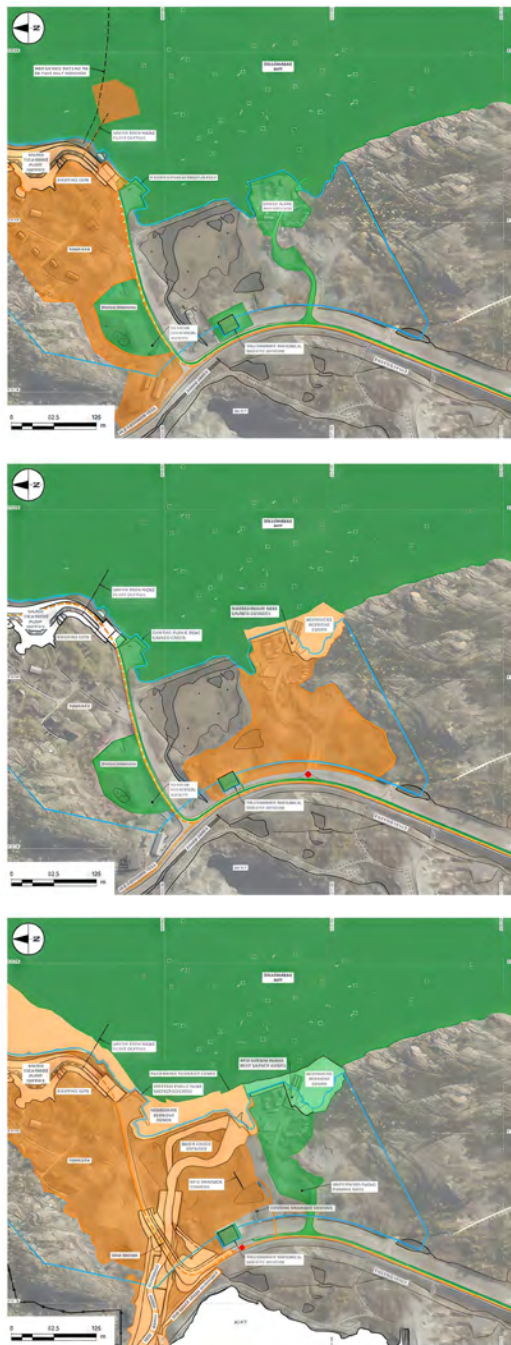
- **July 2028 to May 2030: The Sailing Club site and its parking area will be closed** for remediation. The existing public boat launch will remain open and be shared by the public and the Sailing Club (Figure 3B).
- **May 2030 to June 2038: The current public boat launch and parking area will be closed** for remediation. The Sailing Club will re-open as the "interim public launch" and its two ramps will be shared by the Sailing Club and the public (Figure 3C).
- Note: The area currently used for sailboat storage by Club members will be inaccessible while the Sailing Club site is closed. It is anticipated that this area will also be unavailable during 2030–38, as most if not all the space will be needed for the interim boat launch and a turnaround area.

**Article 2.2 (a) (ii)** of the Giant Mine Remediation Project Environmental Agreement states that the Parties intend that the Agreement will achieve or support the remediation of the Giant Mine site in a manner that protects “the economy, way of life and well-being of the aboriginal peoples of Canada in the vicinity of Yellowknife, and of other residents of Yellowknife, the Northwest Territories and Canada.”

**Figure 3. Boat launch closures.**  
**Images reproduced with permission from CIRNAC.**

- a) **The current configuration** of the public boat launch (left) and the Great Slave Sailing Club (right).
- b) **2028–30:** Planned closure of the Sailing Club (orange, right) while the public launch is shared by the boating community (green, left).
- c) **2030–38:** Planned closure of the public launch (orange, left) while the Sailing Club functions as an interim public launch (green, right).

Expanded images: <https://www.rcaanc-cirnac.gc.ca/eng/1721335542600/1721335566319>



## WHAT DOES GMOB EXPECT?

**GMOB expects that residents and the Parties will have ready access to all information related to community health and well-being.** Residents' access to timely information relies on ready access to information held by GMOB, the Project Team, and the Parties to the Environmental Agreement. This information should give residents a reasonable understanding of:

- The Closure and Reclamation Plan and its implications for future land use, including related human activities, and the post-closure land-use constraints map;
- Current and future public health risks related to dust, runoff, construction, and contaminated soils associated with the Project area;
- Current and future risks related to activities such as hiking, eating fish, gathering medicinal plants and berries and using the boat launch in the area during and after remediation; and,
- Studies on arsenic exposure and related health outcomes, including plain-language (i.e., non-technical) communications regarding the risks of both chronic and acute exposures, and the risks to toddlers, in and around the Project site.

**GMOB expects the Project to bring maximum economic benefits and mitigate negative effects to residents and their ways of life.** GMOB expects that risks to community health and well-being are minimized and are always clearly understood by residents.

**GMOB expects the Project Team to anticipate, proactively address, and monitor the outcomes of the Project's social effects,** including but not limited to:

- social determinants of health (e.g., access to the Land for traditional uses and subsistence, water quality and confidence thereof, etc.);
- potential health and other risks associated with activities, including risks to toddlers;
- impacts of site closures on the community (e.g., boat launch closure impacts on the boating community); and,
- worker housing and how that relates to overall housing and services demands.

## WHAT ACTIONS WERE TAKEN?

### *Arsenic exposure risk and communications*

In 2020, in response to GMOB's recommendation, the Project Team engaged the engineering consulting firm WSP to evaluate hazards and risks associated with acute arsenic exposure — specifically for toddlers — from soil in areas that will not be remediated. Toddlers occasionally ingest more soil than considered in a human health risk assessment (i.e., >1 g compared to 0.08 g), which may significantly increase their exposure to arsenic. WSP provided a preliminary report to the GMWG in October 2022 and submitted a final report in September 2023. In this report, WSP used the HHRA (Human Health Risk Assessment) approach.



The GNWT requested a separate addendum to refine calculations for the highest risk scenarios to provide more clarity in risk messaging; this addendum to WSP's acute arsenic report was completed in late 2024. These scenarios show potentially serious acute risks for toddlers if they happen to ingest a small amount of soil from a highly contaminated area. Former GMOB director, Ken Froese, and the GNWT have begun their review of the addendum. This report will form the basis for risk messaging on- and off-site, to be developed in 2025 with the Chief Medical Health Officer (CMHO).

### **Community health research**

The **Yellowknife Health Effects Monitoring Program (YKHEMP)** studies the human health effects of arsenic and other contaminants resulting from the Giant Mine Remediation Project. The project was initiated in 2017. The first phase of the project was completed in 2018, and the results were presented in-person to Yellowknives Dene First Nation, North Slave Métis Alliance, and the broader Yellowknife community.

The second phase of the project (Year 5 of the program) was completed in 2023 and focused on children and teens ages 3–19. Eligible participants from the first phase were invited to participate, as well as new participants through randomly selected households and volunteers. The YKHEMP team shared individual results with participants in November 2023 and held a public meeting in Yellowknife to review the overall study results. The YKHEMP team has communicated the results of the study and arsenic education bulletins to the public on an ongoing basis, mainly through radio announcements and brochures.

In the third phase of the project (Program Year 10, 2027–28), the study will again sample all age groups.

From 2020 through 2022, the Aurora Research Institute and Queen's University conducted the *Yellowknife Garden Metals Study: Arsenic and Mining Associated Metals in Local Garden Produce in the Yellowknife Area*.<sup>26</sup> The study analyzed the amount of arsenic and other mining-related contaminants (antimony, cadmium, lead, manganese, copper, zinc, and vanadium) in backyard garden soils and produce in Yellowknife, Ndilo, Dettah, and surrounding areas. The study was completed in 2022; however, the project report has not been finalized.

### **Boat launch closures**

The Project Team continued its engagement with the boating community in 2024, with a focus on engaging the boating public (i.e., non-club members) as requested by GMOB (recommendation 2023-2). In the spring of 2024, the Project Team held a general information meeting where the issue of the boat launch was available for discussion but not a key topic. In June 2024, the Project Team held an information session with the boating community (i.e., not specific to clubs).

Information on boat launch closures is available on the [CIRNAC website](#), as well as a [GNWT webpage](#).

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<sup>26</sup> Aurora Research Institute. 2021. *Yellowknife Garden Metals Study* [Website]. <https://nwtresearch.com/yellowknife-garden-metals-study>

### *Worker housing*

GMOB was involved in discussions with the Yellowknife business community as well as the City of Yellowknife regarding the challenges of housing imported labour working at the GMRP. The City of Yellowknife's zoning by-law largely limits the development of "workers accommodation" in Yellowknife.<sup>27</sup>

Businesses in the field of worker accommodations that are operating within the City have approached GMOB with concerns of unfair practices, inconsistent bylaw enforcement, or both. Contractors have also approached GMOB with concerns that the City is not allowing work camps and temporary housing. While this is clearly an issue for the City, GMOB recognizes the implications for Project implementation and economic benefits to the City may be significant, and steps should be taken to address these concerns.

## **WHAT WERE THE OUTCOMES OF THE ACTIONS?**

### *Arsenic exposure risk and communications*

The addendum to the WSP Acute Arsenic Assessment provided further clarification to acute toxicity scenarios by identifying the arsenic exposure risk of additional scenarios (e.g., a toddler that eats a small amount of highly contaminated soil). Importantly, high-risk locations exist both within and outside of the Project's fenceline, and not all areas will be mitigated.<sup>28</sup>

These scenarios will be instrumental in developing clear and effective risk messaging (for example, signage or fencing at high-risk areas).

### *Community health research*

Findings from the second phase of YKHEMP are available online<sup>29</sup> and are summarized here:

- Total arsenic (i.e., organic and inorganic arsenic) concentrations in urine were generally similar in 2023 to results from 2017–18.
  - Inorganic arsenic concentrations in urine decreased slightly; this slight difference may be due to natural variation in arsenic exposures from year to year.
- Cadmium concentrations in urine were higher in 2023 than in 2017–18 but remained below the Canadian average.
- Lead concentrations in urine were higher in 2023 than in 2017–18 and were roughly twice the Canadian average. **These concentrations remain below the levels associated with health effects**, but the study team is nevertheless investigating what could have caused the increase.

27 City of Yellowknife. 2022. Zoning By-law No. 5045. Yellowknife, Northwest Territories. 189 pp. <https://www.yellowknife.ca/Bylaws/Bylaw/Download/bbe559ec-aadd-429f-83a1-99e753f8a680>

28 GNWT. N.d. Arsenic concentrations interactive map. <https://nwtgeomatics.maps.arcgis.com/apps/webappviewer/index.html?id=8e71506a496b4587af25f537cf80d886>. See also Post-Closure Land Use and Constraints Map (Appendix C).



Urinary samples provide a short snapshot of individual exposure, meaning that results can be quite variable. If concentrations of cadmium and lead are high in the third phase of sampling, that may indicate a larger pattern of exposure. GMOB will continue to monitor YKHEMP's results as it progresses into its next phase.

### **Boat launch closures**

GMOB has expressed concerns that there is insufficient space for either boat launch, including their respective parking areas, to meet the combined needs of the boating community (see Figure 4). GMOB remains concerned that the boating public (i.e., non-club members) have not been informed adequately by the Project, and that the boating community has not been sufficiently engaged (i.e., had opportunities to provide input on the plan).

GMOB acknowledges the efforts made by the Project Team to engage the boating public in 2024. The October 2024 information session was unfortunately not well-attended, and the majority of attendees were members of the Sailing Club. GMOB observed that most of the discussion related to the Sailing Club's concerns.

GMOB remains concerned that the engagement to date has not been sufficient to raise awareness of impending closures among the boating public. GMOB acknowledges the challenges in achieving this objective when efforts to engage the boating public are not well-attended. Nevertheless, GMOB maintains the importance of continuing to reach out to the affected parties so they are fully informed of the upcoming closures and implications to lake access.



Satellite image from Google Maps.

**Figure 4. The boat launch areas.**

**Yellow/top:** The public boat launch and parking areas. In **2028–30**, this launch will be shared by the combined boating community. In **2030–38**, it will be closed for remediation.

**Blue/bottom:** The Great Slave Sailing Club boat launch and parking area, and overflow parking outside of their lease. In **2028–30**, this launch will be closed for remediation. In **2030–38**, it will be shared by the combined boating community.

### ***Worker housing***

There has been no resolution to this issue. However, the Parties are taking greater interest in worker housing and the issue has made its way into the public domain through media coverage.

## **WHAT DOES GMOB OBSERVE?**

### ***Observation OBS-2024-12***

Work remains to be done to evaluate and communicate acute arsenic exposure risk in high-risk areas both within and outside of the fenced Project area, particularly the risk to a toddler that may eat a small amount of highly contaminated soil. GMOB will continue to monitor this topic and anticipates that the GNWT Chief Medical Health Officer (CMHO) will soon be involved in the development and posting of appropriate risk messaging. Examples of potential messaging for high-risk areas, once identified, may include fencing and signage in English, French, and Willideh. It is GMOB's view that acute arsenic exposure risk, and associated messaging, need to be included in land-use planning and the PCP. GMOB looks forward to learning what the CMHO determines and recommends.

### ***Observation OBS-2024-13***

GMOB observes that there are no signs at the public boat launch informing the boating public of upcoming closures, timelines for closures, maps of closures, or contact information if the boating public has questions or comments.

### ***Observation OBS-2024-14***

The absence of adequate housing for workers has repercussions for the Project and for the retention of economic benefits within and around Yellowknife. This question falls to the City of Yellowknife and the GNWT (e.g., through a joint housing strategy or other joint policy approach), and GMOB will continue to monitor the situation.

## **WHAT ARE THE NEXT STEPS?**

### ***Arsenic exposure risk and communications***

GMOB continues to maintain that deliberate, accessible, and continuous communication with the broader Yellowknife community regarding arsenic exposure risk is essential to avoid negative health impacts, both during and after active remediation. GMOB will continue to monitor this topic and anticipates that the GNWT Chief Medical Health Officer (CMHO) will become involved in developing appropriate risk messaging (see What does GMOB observe?).

### ***Boat launch closures***

GMOB continues to encourage the Project Team's efforts to inform the boating public of upcoming closures and their expected impacts. As 2028 approaches, it becomes more urgent that the entire boating community has opportunities to meaningfully engage with the Project Team's proposed plan. GMOB anticipates that the boat launch closures will have serious social impacts, and that these impacts will be even greater if the boating community remains unaware of the extent and duration of closures.

In addition to GMOB's continued encouragement that the Project Team engage more fully with the boating public, GMOB has the following outstanding questions:

- **Where will the boating community park their trucks and trailers?** GMOB observes that current parking areas are insufficient to handle the volume of both boating groups, and that the public launch parking area is too small for the volume of vehicles it already receives on weekends.
- **Where will Sailing Club members store their sailboats during construction?** The current boat storage area will be unavailable during remediation. When the area becomes the interim public boat launch, it is expected that the interim ramps and vehicle turnaround areas will not leave room for sailboat storage.

GMOB will continue to encourage the boating community to engage with the Project Team when opportunities arise.

### ***Worker housing***

GMOB will continue to monitor the situation regarding worker housing, with a focus on its effects on the GMRP.

## LONG-TERM PLANNING

*The Long-term Planning section discusses plans being made today for the Project's **post-closure period, which is currently scheduled to begin in 2038**. This section focuses primarily on the Perpetual Care Plan (PCP), which is the primary mechanism for long-term planning.*

### WHY IS THIS IMPORTANT?

Perpetual care of the Project site was raised during the Giant Mine Remediation Project Environmental Assessment. The Review Board concluded that there was significant public concern regarding the long-term management of the site and, during the proceedings, the GMRP committed to developing a comprehensive Perpetual Care Plan (PCP). The Project Team also agreed that the “freeze in place” option for the arsenic trioxide dust stored underground at the site would be a temporary measure.

Work on the Project site will continue for the indefinite future. The planned remediation will reduce most of the hazards on the site but some residual risks will need to be managed in perpetuity (e.g., access to un-remediated areas of the site, water treatment, etc.). A robust plan is needed to account for all the elements of the site that will require regular monitoring and maintenance (i.e., perpetual care).

After remediation, some areas of the site may be available for commercial, recreational, or residential use; other areas will be permanently off limits. Decisions being made today as part of active reclamation will have consequences for possible future activities and land uses, and the degree of risk in using parts of the site. Future land uses need to be better planned and communicated, so that remediation decisions do not inadvertently reduce options for possible future activities.

**Section 4.2 (a)** of the Agreement states that, “the Co-Proponents shall develop a comprehensive Perpetual Care Plan that must address improvements in records management, communication with future generations, long term access to funds for the Project and analysis of different possible future scenarios that might affect the Perpetual Care of the Project.”

**Section 4.2 (b)** of the Agreement states that, “the Co-Proponents shall provide the Oversight Board with a first draft Perpetual Care Plan no later than five years after the Effective Date of this agreement (June 09, 2015).”

### WHAT DOES GMOB EXPECT?

**GMOB expected that the PCP would be completed in accordance with the Environmental Agreement (i.e., no later than June, 2020).** Drafting of the Perpetual Care Plan did not begin until fall 2024, after a contractor was selected.

**GMOB expects that the PCP and land-use planning will include planning for the implementation of a permanent solution for the arsenic trioxide dust currently (and temporarily) stored underground.** The GMOB research program is progressing and is continuing work on promising options for a permanent solution. To

eventually implement a permanent solution, the arsenic trioxide dust will need to be accessed, extracted, transformed, and stored in its transformed state. The timelines for these activities are expected to extend beyond active remediation and thus fall under long-term care. Monitoring the emptied chambers and the transformed dust would presumably require perpetual care. Similarly, land-use planning will need to account for the eventual infrastructure needs of full-scale extraction, transformation and storage, and any needs to restrict access to areas of the site. GMOB expects that these items will be discussed with the PCP contractor.

**GMOB expects that the PCP and land-use planning will continue to highlight and incorporate risk management and public health messaging** related to acute arsenic risks in un-remediated areas both on- and off-site. High-risk areas must be identified to inform land-use planning, and effective messaging must be developed to reduce the risk of high-risk scenarios (e.g., a toddler eating a small amount of highly contaminated soil).

**GMOB expects that the PCP will outline mine water management to continue to maintain the water level below the chambers (i.e., below 750 m) in perpetuity,** as discussed during development of Water License submissions in response to clearly stated community concerns, and as committed to by the Project Team.

**GMOB expects that there will be adequate funds over the long term** to implement the approved PCP, and to guarantee funds to address any future issues as they arise. The issue of long-term funding and models for the management of those funds has not been resolved through the Deloitte report prepared for CIRNAC.<sup>30</sup> The PCP provides an opportunity to resolve these issues.

## **WHAT ACTIONS WERE TAKEN?**

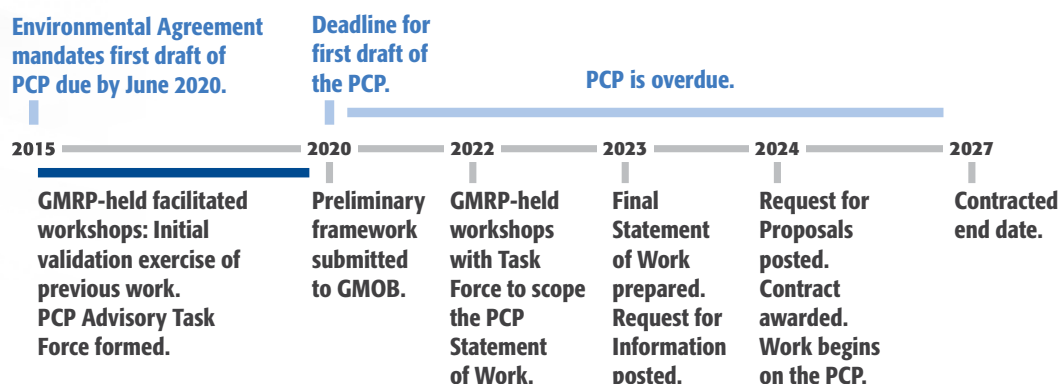
The Request for Proposals (RFP) for the PCP was posted to the federal government's procurement website on January 9, 2024 and closed on April 5, 2024 (Figure 5). ERM Consultants was selected and received the contract to sign on June 3, 2024, without any direct involvement of the other Parties. The work to complete the PCP is anticipated to take two to three years, with a contracted end date of March 31, 2027, and a budget of \$1.89 million.<sup>31</sup>

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<sup>30</sup> Deloitte. 2019. Development of options for consideration for long term funding for Giant Mine. Report prepared for Crown-Indigenous Relations and Northern Affairs Canada. [https://opac.libraryworld.com/opac/catalog\\_view.php?catalog\\_id=459&from\\_doc=standard.php&position=1](https://opac.libraryworld.com/opac/catalog_view.php?catalog_id=459&from_doc=standard.php&position=1)

<sup>31</sup> Government of Canada. 2024. A7126-225261 Perpetual Care Plan (Giant Mine, NT). <https://canadabuysscanada.ca/en/tender-opportunities/contract-history/ws3983596456-cw2306300-acm182955520-000>

**Figure 5. High-level timeline of the PCP's development.**



The PCP Task Force<sup>32</sup> last met on Oct. 31, 2024. The PCP Task Force will continue to operate throughout the development of the first version of the PCP.

In 2023, GMOB recommended (2023-7) that the Project Team include a representative of the GMWG in the evaluation process to select the successful contractor for the development of the draft PCP, and that the GMWG be involved in the review of draft documents as the contract progresses. Instead, the Project Team asked GMOB to sit on the team that evaluated proposals. GMOB declined the invitation, stating that it would be a conflict as the Board will be reviewing the final PCP. GMOB understands that the Project Team did not reach out to anyone else, including the GMWG.

GMOB understands that the selected contractor did not reach out to GMOB or engage with the Parties in 2024. GMOB acknowledges that PCP development remains in its early stages.

Several activities occurred in 2024 that have long-term implications for the PCP and the GMOB research program. These activities are described in detail in [Project Management and Planning](#), and they include:

- Closure of the underground (complete).
- Cemented-paste backfill capping the arsenic trioxide dust in the underground chambers (complete).
- Arsenic-contaminated waste disposal in Chamber 15 and B1 pit (planned).

The long-term implications of these activities and plans are discussed in the following section.

<sup>32</sup> The PCP Task Force includes representatives from the Parties. This Task Force provided advice to CIRNAC that helped to inform the development of the PCP Request for Information and, subsequently, Request for Proposals.

## WHAT WERE THE OUTCOMES OF THE ACTIONS?

GMOB did not receive any updates or meeting requests from the PCP contractor in 2024 and is unable to comment on the contractor's planned approach, including its engagement strategy, at this point.

The implications of remediation activities and plans from 2024 on long-term planning include:

- **Closure of the underground (complete):** Construction of a long-term portal is scheduled; however, details regarding steps and procedures for re-entry have not yet been communicated. It is GMOB's understanding that re-accessing the underground will require many steps, including but not limited to a risk assessment, replacing safety stations, etc. GMOB is unaware of procedures or plans for rapid re-entry in the event of an emergency, both for the remainder of active remediation and during post-remediation.
- **Cemented-paste backfill capping the arsenic trioxide dust in the underground chambers (complete):** The empty space at the top of chambers containing the arsenic trioxide dust has been backfilled with a cemented paste. The implications of this activity on the eventual extraction of the arsenic trioxide dust (and potential future storage of transformed material) are as yet unclear to GMOB. See also [GMOB Research Program](#).
- **Arsenic-contaminated waste disposal in Chamber 15 and B1 pit (planned):** Materials contaminated with arsenic trioxide dust are planned to be dumped underground and frozen in place. It is not clear whether there will be any waste segregation or rinsing of materials. Should a permanent solution to the arsenic trioxide dust be implemented, accessing and extracting the dust contaminating these materials may present a significant engineering challenge and steep cost. GMOB is unaware of the implications of this plan for both a permanent solution and perpetual care more generally.

Additionally, acute arsenic exposure risk (see [Community Health and Well-being](#)), particularly to toddlers, has implications for land-use planning and risk messaging. Land-use planning, appropriate risk messaging, and the PCP are all closely entwined as they relate to how people will use the site following closure. It is essential that these components inform one another (for example, by including land-use planning and acute arsenic risk messaging as chapters within the PCP) so that the people who live, work, and recreate in the region can use the site safely. GMOB will continue to monitor this work as it progresses.



## WHAT DOES GMOB OBSERVE?

### *Observation OBS-2024-15*

GMOB was not engaged by the selected PCP contractor in 2024, nor is GMOB aware of any other engagement occurring in 2024. GMOB maintains the critical importance of including the GMOB research program (and its findings), land-use planning, long-term funding, and risk communication — including acute exposure risks — in the PCP. GMOB looks forward to engaging with the PCP contractor in 2025 to discuss these and other items.

### *Observation OBS-2024-16*

The Project Team has stated or implied on at least two occasions that it did not to meet the PCP timeline outlined in the Environmental Agreement because it disagreed with the need for a PCP before reclamation is complete, and did not see it as a priority given the other remediation-related tasks it was undertaking.<sup>33,34</sup> It is GMOB's view that the PCP and the remediation plan should inform one another, so that engineering, access, and other requirements to enable perpetual care activities to be more explicitly integrated into remediation plans. Delays in finalizing the PCP could mean lost opportunities to appropriately adjust the remediation plan.

## WHAT ARE THE NEXT STEPS?

GMOB will reach out to the selected PCP contractor and request a meeting to learn more about the contractor's planned approach. GMOB looks forward to the opportunity to ask questions and provide suggestions for items that will need to be considered under the PCP, including but not limited to:

- the eventual treatment and safe storage of the arsenic dust currently stored underground, as informed by the GMOB research program;
- land-use planning;
- acute arsenic exposure risk and messaging;
- long-term funding and scenarios around governance at the site; and,
- the plan for maintaining the water level below the chambers after surface remediation is completed.

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33 GMOB. 2024. 2023 Annual Report (page 45, response to recommendation 2022-10). <https://gmob.ca/wp-content/uploads/2024/05/GMOB-Annual-Report-2023.pdf>

34 Lamberink, L. 2024, June 4. Cutting CO2 emissions not top priority for Giant Mine clean-up, but official says they'll 'do our best.' CBC News. <https://www.cbc.ca/news/canada/north/giant-mine-emissions-1.7221531>



## GMOB RESEARCH PROGRAM

*The GMOB Research Program section discusses research progress, outcomes, and next steps in investigating potential permanent solutions for the arsenic trioxide dust currently stored underground.*

### WHY IS THIS IMPORTANT?

A total of 237,000 tonnes of arsenic trioxide dust is stored in 14 underground stopes (excavated chambers) at the Giant Mine site. By the end of remediation in 2038, a “frozen block” method will be applied to freeze the ground around and inside the chambers that contain the dust, preventing water from entering them. Chambers that have not yet been frozen are protected by continually pumping out mine water before it enters them.

The frozen block method was recommended by CIRNAC as a permanent solution following an expert review process and public engagement. In the 2013 public Environmental Assessment of the Giant Mine Remediation Project,<sup>35</sup> the MVEIRB concluded that the frozen block method “will proceed only as an interim solution for a maximum of one hundred years. A permanent alternative is necessary beyond that point.”

Measure 3 of the Environmental Assessment states that, “[t]o facilitate active research in emerging technologies toward finding a permanent solution for dealing with arsenic at the Giant mine site, the Developer will fund research activity as advised by stakeholders and potentially affected Parties through the Oversight Body [...] The Oversight Body will ensure through the research activity that, on a periodic basis:

1. reports on relevant emerging technologies are produced;
2. research priorities are identified;
3. research funding is administered;
4. results of research are made public, and
5. results of each cycle are applied to the next cycle of these steps.

Measure 4 of the Environmental Assessment<sup>36</sup> states that, “[t]he Oversight Body will provide the results of the research funded by the Developer to the periodic reviews of the Project[...]. If better technological options are identified through the funded research in-between these periodic 20-year reviews, these will be reported publicly by the Oversight Body to the Parties, the Developer and the Canadian public. The Developer

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<sup>35</sup> Mackenzie Valley Review Board. 2013. Report of Environmental Assessment and Reasons for Decision – Giant Mine Remediation Project (EA0809-001). 245 pp. [https://reviewboard.ca/upload/project\\_document/EA0809-001\\_Giant\\_Report\\_of\\_Environmental\\_Assessment\\_June\\_20\\_2013.PDF](https://reviewboard.ca/upload/project_document/EA0809-001_Giant_Report_of_Environmental_Assessment_June_20_2013.PDF)

<sup>36</sup> Note: These citations quote the final approved wording of modified measures by the Federal Minister under the Mackenzie Valley Resource Management Act. The letter that is the source of these modifications is found here: [https://new.reviewboard.ca/sites/default/files/project\\_document/EA0809-001\\_Final\\_decision\\_letter\\_from\\_AANDC\\_Minister\\_to\\_MVRB\\_Chairperson.PDF](https://new.reviewboard.ca/sites/default/files/project_document/EA0809-001_Final_decision_letter_from_AANDC_Minister_to_MVRB_Chairperson.PDF)

will consider these technologies and make decisions regarding their feasibility. The Developer will make any such decisions public.”

Article 7 of the Agreement tasks GMOB with managing a formal research program focused on finding a permanent management solution for the arsenic trioxide dust currently stored underground at the site. It is important to arrive at a safe and permanent solution so current and future generations are not burdened with this liability. The GMOB research program has three components:

1. GMOB-funded research with the TERRE-NET<sup>37</sup> (Toward Environmentally Responsible Resource Extraction Network) partnership;
2. other research with TERRE-NET partners made possible by accessing funds from external sources; and,
3. research proposals from other researchers.

### WHAT DOES GMOB EXPECT?

**GMOB expects that the Project Team will remain up to date on the research program’s findings** and the implications for reclamation planning and incorporation into the PCP, as well as keeping GMOB updated on the implications of surface and sub-surface remediation planning for the eventual extraction and storage of the dust.

**GMOB expects the Project Team to ensure future access to the chambers containing the arsenic trioxide dust**, including beyond the completion of surface remediation in 2038. Construction of a long-term portal has been scheduled for 2026; however, the Project Team has not shared information with GMOB regarding procedures for re-entry, either during surface remediation or post-remediation.

GMOB expects that a permanent solution will entail the following key steps:

- **extraction** of the dust from the underground, safely and without risk of exposure to either workers or surrounding communities;
- **transformation** of the dust into a product that is much less likely to release arsenic if exposed to air or water;
- **storage** of the transformed product; and
- managing any **residual dust** that cannot be recovered and treated.

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37 Toward Environmentally Responsible Resource Extraction Network (TERRE-NET) is an integrated network of leading academics from universities across Canada. One of TERRE-NET’s goals is to manage hazardous mine wastes.

## WHAT ACTIONS WERE TAKEN?

In 2024, the Project Team drilled and extracted 600 kg of arsenic trioxide dust from a stope that had not previously been sampled. These samples capture the different vertical layers of dust that were deposited over time as gold processing technologies evolved. GMOB acknowledges the effort and costs incurred by the Project Team in extracting these samples, which will play a critical role in evaluating the large-scale feasibility of the stabilization methods being researched.

The seven GMOB-funded and co-funded research projects continued to progress in 2024. While the projects will not be considered “complete” until their results have been published in a peer-reviewed publication, several of the projects have made enough progress to evaluate their feasibility for stabilizing the arsenic trioxide dust at scale. A full update of individual projects and their progress is provided in [Appendix C](#).

GMOB signed a new five-year Master Research Agreement with TERRE-NET, which is based out of the University of Waterloo, in November 2024. GMOB’s funding commitment will be reviewed annually. As part of this agreement, GMOB will fund a second research phase of dust characterization (Project 1) using the newly extracted samples and vitrification (Project 5, transforming the arsenic into glass). While GMOB has chosen not to fund further work by the other research projects, several of them will continue thanks to continued funding by TERRE-NET and the Natural Sciences and Engineering Research Council (NSERC). A summary of project outcomes and the rationale for continuing or discontinuing funding is provided in the following section.

GMOB received and considered several research proposals from independent researchers. While several projects were of interest, GMOB was unable to pursue them due to a lack of available funds.

GMOB continues to develop its research strategy, which will outline GMOB’s approach for strategically allocating its remaining research dollars and maximizing the applicability of research outcomes. The research strategy and associated implementation plan will be released in 2025.

## WHAT WERE THE OUTCOMES OF THE ACTIONS?

GMOB has decided to fund a second phase of **vitrification** (turning the dust to glass, Project 5) for the following reasons:

- Of the technologies tested to date, only vitrification was far enough along to test leachability.
- The arsenic glass produced using vitrification performed very well in leachability tests. When exposed to running water during the bench-scale experiments, arsenic release was minimal and remained well below safe levels for the duration of the experiments.
- Vitrification is an established stabilization process and a known technology, with options for building a transformation facility on-site.

The new samples extracted by the Project Team will be critical for the next phase of the GMOB research program. The new samples will make it possible to broaden the **dust characterization research** (Project 1) to better understand the variability within the arsenic trioxide dust.

GMOB notes that its decision to fund a second phase of work for these two projects does not indicate that the other technologies tested were unsuitable. Rather, funding limitations have required GMOB to narrow its efforts on the most promising single stabilization technology to the exclusion of others. Vitrification research has progressed the most quickly while demonstrating extremely promising results when exposed to running water in bench-scale experiments to simulate natural conditions and weathering over time. The other projects hold substantial promise, and several will proceed thanks to funding from NSERC and TERRE-NET.

Individual research project progress updates and publications (if available) are provided below. For project summaries, see [Appendix C](#).

- **Project 1:** Understanding the makeup of the arsenic dust at Giant Mine (University of Saskatchewan and Queen's University) – **90% complete**
  - [Arsenic and antimony geochemistry of historical roaster waste from the Giant Mine, Yellowknife, Canada](#)
- **Project 2:** Understanding the long-term stability of iron arsenic solids (University of Saskatchewan and Queen's University) – **50% complete**
- **Project 3:** Turning arsenic dust into a mineral that won't dissolve in water (University of Ottawa) – **75% complete**
  - [Investigating the sulfidation and high-temperature \(100 °C – 200 °C\) dissolution of As<sub>2</sub>O<sub>3</sub> stored at the Giant Mine, NWT, Canada](#)
- **Project 4:** Using bacteria from the environment to produce an essential ingredient for stabilizing arsenic (University of Waterloo) – **70% complete**
- **Project 5:** Testing the long-term safety of arsenic-containing glass (University of Waterloo) – **90% complete**
  - Geochemical stability of vitrified-arsenical glass prepared from arsenic trioxide roaster waste from the Giant Mine (Yellowknife, NT) [Peer review in progress]

- **Project 6:** Trapping arsenic dust in a cement paste to be stored underground (Université du Québec en Abitibi-Témiscamingue and University of Alberta) – Step 1: **100% complete**; Step 2: **70% complete**
  - [The effects of arsenic trioxide addition on the mechanical and geochemical properties of the cemented paste backfill](#)
  - [Geomechanical aspects of stabilizing arsenic trioxide roaster waste in cemented paste backfill at the Giant Mine, Canada](#)
  - [Study on the leaching behavior of cemented paste backfill containing arsenic trioxide roaster waste](#)
  - [Study of the effects of arsenic trioxide roaster waste dusts on the mechanical behaviour of cemented paste backfills](#)
- **Project 7:** Monitoring arsenic pollution using a stable isotope analysis of antimony (University of Waterloo) – **50% complete**

## WHAT DOES GMOB OBSERVE?

### *Observation OBS-2024-17*

Communication, engagement, and collaboration between GMOB and the Project Team will be essential to ensure that both surface reclamation and the GMOB research program advance without working at cross-purposes. Without this collaboration, inadvertent and potentially costly obstacles to the dust's eventual extraction, transformation, and storage are inevitable. Closing the underground and backfilling the chambers containing arsenic trioxide dust are examples of activities with implications for the eventual implementation of a permanent solution. The research program must likewise be an important consideration during the development of the PCP.

## WHAT ARE THE NEXT STEPS?

In 2025, GMOB will proceed with the steps identified in its Strategic Research Plan and Implementation Plan. These next steps include:

- **Increasing the focus on extraction technologies** by commissioning a study into required extraction efficiency, identifying or establishing a research network that can conduct research into potential extraction methods, releasing a call for Proposals, and funding one or more research project.
- **Funding a second phase** of 1) characterizing the makeup of the new samples that were collected by the Project Team and 2) vitrification (see below for more details).
- **Presenting the research projects** to the Project Team, Parties to the Environmental Agreement, and the public in 2025. Presentations and public outreach will occur on two-year cycles.

Dust characterization research will proceed to a second phase, providing a clear picture of the different properties of dust samples collected at different depths.

Vitrification research will proceed to a second phase, with the goal of further understanding and improving the glass's feasibility as a permanent solution. The research will have two areas of focus:

1. Testing a range of "recipes" for producing the glass. One option to be explored is replacing some of the sand used to produce the glass with tailings from the Project site. If successful, this approach would reduce the amount of sand to be purchased and transported to the plant. Another option is a process called "annealing," where the glass will be cooled slowly in steps to make the final product physically stronger.
2. Selecting the best "recipe" and putting the glass through an expanded series of experiments, including but not limited to:
  - a. column (running water) experiments,
  - b. testing the effect of surface area (e.g., crushed vs beads vs blocks vs large blocks) on leachability, and
  - c. field experiments that expose the glass to different environments, temperatures, etc.

Important questions remain around extraction, how much glass would be produced, sourcing materials for vitrification, and where and how the glass may be stored. The responsible parties for answering these questions (e.g., through a class 5 preliminary Engineering study) has not been identified. GMOB has identified these gaps in its draft research strategy and looks forward to conversations with the Project Team and Parties to determine next steps.

GMOB will continue to invite independent research proposals and investigate potential linkages with other similar initiatives. GMOB's Independent Advisory Group<sup>38</sup> will evaluate proposals submitted to GMOB and make its recommendations. GMOB will seek additional funding sources for the research program, with the goal of increasing its capacity to fund these projects of interest.

GMOB will work closely with the Project Team to ensure that it is fully informed of research developments and their implications for site remediation. GMOB in turn will continue to request information from the Project Team of plans that may affect the Research Program and a potential permanent solution, including ensuring access to the chambers, extraction, and safe storage of the arsenic trioxide dust.

Notwithstanding the progress on the research front at a laboratory scale, GMOB will continue to be mindful of communicating internal and external expectations regarding the potential challenges (e.g., aligning the timelines for the Research Program with Phases 1 and 2 of site engineering) when the permanent solution is scaled beyond the laboratory to the Project site.

GMOB will continue to share, in accessible and relevant language, formal progress reports of its research program on its website and at its public meetings.

GMOB will plan for regular workshops with the GMOB Research Program researchers and the public. The next anticipated workshop will take place in 2025. The GMOB Research Program Public Meeting Report for the 2023 workshop is available through the GMOB website.<sup>39</sup>

#### **TOWARDS A RECOMMENDATION FOR A PERMANENT SOLUTION**

GMOB is using a stepwise approach to develop its research program. In 2003, CIRNAC recommended freezing the arsenic trioxide waste in place as a permanent solution. In 2015, GMOB's State of Knowledge review concluded that freezing in place was acceptable as an interim solution, but that other promising options existed (e.g., vitrification). GMOB continues to find that vitrification can produce a stable product using arsenic trioxide dust from Giant Mine and is focusing on advancing this research.

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38 GMOB's Independent Advisory Group includes Professors from Université du Québec à Montréal and University of Manitoba with expertise in mine waste and remediation.

39 GMOB. 2023. Research Program Report. 32 pp. <https://gmob.ca/wp-content/uploads/2023/11/2023-11-GMOB-Research-Program-Public-Meeting-Report-F.pdf>





# APPENDICES

## APPENDIX A

### The 2024 Status of Previous Recommendations

The status of previous GMOB recommendations is assessed as follows:

- **ADDRESSED:** Actions were taken to implement the recommendation. Actions may be completed or showing evidence of progress toward completion in the foreseeable future. Even though a recommendation may be assessed as “addressed,” GMOB will continue to monitor the matter in question with the view to understanding the outcomes of actions taken.
- **IN PROGRESS:** Actions were taken to implement the recommendation, but progress is insufficient to determine if completion can be anticipated in the future.
- **NOT ADDRESSED:** The party to whom the recommendation was directed either did not accept and/or did not act on the recommendation.
- **NOT ADDRESSED AND NO LONGER RELEVANT:** GMOB has concluded that the recommendation is no longer relevant in current circumstances.

**Note:** unless a direct quote, the term “Project Team” is used in the following table to refer to the Co-Proponents for consistency with the rest of this report.

YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Environment</b>		
2016-7A/B	Improve integration, monitoring, and reporting on environmental activities.	<b>IN PROGRESS:</b> Management and monitoring plans have been completed and approved or are being prepared. With the Remediation Project now in the active remediation phase, continual monitoring of plan development and implementation will be required.
2017-10	Reduce greenhouse gas (GHG) emissions where feasible, consider offsets, and report annually.	<b>IN PROGRESS:</b> The Project Team committed to annual reporting and reductions where feasible. However, commitments fall short of current federal government policies.
2018-9	Develop a short- and long-term strategy that sets targets and commits to action to proactively reduce GHG emissions.	<b>IN PROGRESS:</b> The Project Team committed to a GHG assessment for the water treatment plant design; limiting fuel use; reducing haul distances for borrow; tracking GHG emissions on a monthly basis; and annual reporting on emissions. GMOB will monitor these commitments and assess them within the context of current federal government policies.
2021-1	To enhance project oversight activities, GMOB recommends that the Project Team undertake more active reporting on key indicators of trends in each of the seven areas: 1) Environment, 2) Economy, 3) Engagement, 4) Reconciliation, 5) Project Management and Planning, 6) Community Health and Wellness, and 7) Long-term planning.	<b>NOT ADDRESSED:</b> The Project Team stated in its response to the GMOB 2021 Annual Report recommendation that, “The Project team does not support the development of additional indicators to those that have already been developed.” GMOB encourages the Project Team to continue to identify key indicators and actively report on them.

YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Environment</b> CONTINUED		
2022-1	GMOB recommends that the GMRP adopt and communicate the standards by which they track and compare annual GHG emissions.	<p><b>IN PROGRESS:</b> Project Team Response: The MCM [Main Contract Manager] tracks and reports on site GHG emissions. However, given the short period in which this data has been collected, the Project Team believes there is an insufficient amount of data to complete an accurate comparison of annual GHG emissions. In response to GMOB's comments on the 2022 Status of Environment Report, the Project Team committed to further discussions on GHG emissions including a climate change indicator in future reports, once a sufficient amount of data is collected.</p> <p><b>IN PROGRESS: GMRP Draft Annual Report: 6.2.3. Greenhouse Gas Emissions.</b> The Project Team is taking several steps to proactively reduce GHG emissions and implement federal climate action policies. The Project Team stated that it is fully committed to finding opportunities to reduce its GHG emissions during implementation. The principal source of GHG emissions from implementation activities will be through the operation of heavy construction equipment. Given that heavy construction equipment must be used for a remediation project of this nature, the principal tool available to minimize GHG emissions will be to minimize fuel use and reduce haul distances where possible. As required for all new federal buildings, the Project Team has been undertaking a GHG assessment of the design of the new water treatment plant to be constructed onsite. This includes a life cycle analysis of the heating system and all supporting equipment. In 2022, the Project Team engaged the GMWG on the Water Treatment Plant Design Plan, with a focus on providing an update on the GHG Emissions Study. GHG emissions will be calculated for each option over the 40-year lifespan of the facility to demonstrate the reduction in emissions. Results of this assessment will be considered in the final design of the new Water Treatment Plant (CIRNAC, 2022a) (CIRNAC, 2022b) (CIRNAC, 2022c). The MCM Tracks and reports on the Project's GHG emissions monthly. The indirect emissions emitted on site in 2022-23 (April 2022 to March 2023) were 2.12M Kg CO<sub>2</sub>e and the direct emissions emitted on site were 2.04M Kg CO<sub>2</sub>e. These emissions are lower than emissions in 2021-22, the baseline year for emissions tracking. Future reports will provide trend information and will include explanations for the observed trends, where available.</p>

YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Environment CONTINUED</b>		
2022-2	GMOB recommends that the Aquatics Advisory Committee (AAC) continue to operate on an as-needed basis to provide a venue for updates, to share knowledge, and seek advice on all things related to aquatics management for 2023-24. The Project Team should evaluate with AAC members the need to continue or cease operations after 2024.	<p><b>IN PROGRESS:</b> Project Team Response: The Project Team will continue to hold AAC meetings on an as-needed basis.</p> <p><b>IN PROGRESS: GMRP Draft Annual Report:</b> 8.1.1 Aquatic Engagement In 2022-23, the Project Team met several times with the AAC to discuss the <i>Fisheries Act</i> Authorization and future AEMP reference area locations. Committee members also took part in a tour of site.</p>
<b>Economy (Socio-Economic)</b>		
2016-11	Apply a structured framework from a community health and well-being perspective to evaluating social, economic, and cultural aspects of the Remediation Project.	<b>ADDRESSED:</b> Improvements in public engagement and communications especially for various studies and plans indicate that this framework is not needed.
2017-1 2018-1	Develop and implement a socio-economic strategy to ensure northerners, particularly local Indigenous people, are positively impacted by the Project.	<b>ADDRESSED:</b> The strategy developed has an implementation plan to guide monitoring. However, the effectiveness of this response is unclear. GMOB will continue monitoring the responses to this recommendation.
2019-1	Appoint a special envoy to work with the various interests to develop and implement an integrated economic strategy.	<b>NOT ADDRESSED:</b> The Project Team has not provided a qualified independent or internal lead for socio-economic reporting. The process of updating the <i>Socio-Economic Strategy, 2016-2021</i> is an opportunity to engage this expertise.
2020-2	Use the findings of GMOB's independent review to improve outcomes and reporting on its Socio-Economic Strategy, 2016-2021 as well as strategy renewals and updates.	<b>NOT ADDRESSED:</b> The Project Team responded to GMOB's independent review and recommendations but offered no commitments. The proposed update of the <i>Socio-Economic Strategy, 2016-2021</i> provides an opportunity to make progressive change.
2020-3	Bring forth socio-economic considerations identified in the Perpetual Care Plan framework into the goals of the Perpetual Care Plan.	<b>NOT ADDRESSED:</b> The Socio-Economic Working Group has not addressed any perpetual care planning considerations. The development of a PCP continues to be delayed.
2020-4	Ensure northerners have central roles in the care, maintenance, and management of the Giant Mine site into the future.	<b>NOT ADDRESSED:</b> The development of a PCP continues to be delayed.
2021-1	To enhance project oversight activities, GMOB recommends that the Project Team undertake more active reporting on key indicators of trends in each of the seven areas: 1) Environment, 2) Economy, 3) Engagement, 4) Reconciliation, 5) Project Management and Planning, 6) Community Health and Wellness, and 7) Long-term Planning.	<b>NOT ADDRESSED:</b> The Project Team stated in its response to the GMOB 2021 Annual Report recommendation that, "The Project Team does not support the development of additional indicators to those that have already been developed." GMOB encourages the Project Team to continue to identify key indicators and actively report on them.

YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Economy (Socio-Economic) CONTINUED</b>		
2021-2	GMOB will continue to bring concerns about contracting processes to the Project Team and advocate for new tools and approaches to address these issues. GMOB recommends that the Project Team meet with local contractors to discuss opportunities for improving contracting processes.	<b>NOT ADDRESSED:</b> The Project Team identified Parsons, the MCM, as responsible for engaging with the business community and gathering lessons learned on contracting tools used to procure work on the site. This is valid but does not address the concern that GMOB highlighted, which was to actively listen to and consider the input of local contractors who are affected by the federal policies on how contracts are set up, awarded and managed.
2022-3 (continued next page)	GMOB recommends the Socio-Economic Working Group meet no more than three or four times a year while the associated Advisory Body meet only once or twice per year. These meetings are time-consuming and expensive and not always well attended. Without metrics to determine if the meetings serve their intended purpose, GMOB questions their value.	<p><b>NOT ADDRESSED:</b> Project Team Response: "The Socio-Economic Advisory Body was established in late 2018 and the Working Group in early 2019. However, neither of these groups play the lead role in implementing socio-economic activities for the Project, as this lies with the GMRP team. From the Terms of Reference for the two groups:</p> <ul style="list-style-type: none"> <li>• SEWG [Socio-Economic Working Group]: coordinate and conduct activities related to the implementation of the GMRP's Socio-Economic Strategy</li> <li>• SEAB [Socio-Economic Advisory Body]: provide strategic advice to the Socio-Economic Working Group and act as senior government champions for the implementation of the SE Working Group's approach.</li> </ul> <p>Regarding frequency of meetings, the Project Team has sent out several surveys to Working Group committee members to gauge their interest and effectiveness of the committee. The frequency of meetings was adjusted from every month to every other month based on the response to the surveys. Attendance continues to be strong, with the greater majority of member groups always represented. Individual member representatives continue to change but that is normal for a committee of this size and diversity. The Project Team will continue to monitor and evaluate frequency of these meetings."</p>

YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Economy (Socio-Economic) CONTINUED</b>		
2022-3 (continued)	GMOB recommends the Socio-Economic Working Group meet no more than three or four times a year while the associated Advisory Body meet only once or twice per year. These meetings are time-consuming and expensive and not always well attended. Without metrics to determine if the meetings serve their intended purpose, GMOB questions their value.	<p><b>NOT ADDRESSED:</b> GMRP Draft Annual Report: 8.2 Socio-Economic 2022-23 Highlights</p> <ul style="list-style-type: none"> <li>• The Project Team finalized a revised five-year Socio-Economic Strategy through engagement with the Socio-Economic Working Group and the Socio-Economic Advisory Body. The Socio-Economic Working Group and the Socio-Economic Advisory Body continued to provide expertise and support to advance implementation of the Socio-Economic Strategy.</li> <li>• The Project Team met with GMOB once to discuss its recommendations on socio-economic analysis and reporting and continues to keep open communication with GMOB to provide requested statistics. GMOB also attended all of the Socio-Economic Working Group and Socio-Economic Advisory Body meetings.</li> <li>• The Project Team and the NSMA [North Slave Métis Alliance] signed a Community Benefit Agreement on March 6, 2023.</li> <li>• Funding for training has been committed by the Project Team as part of the Community Benefit Agreement for YKDFN's [Yellowknives Dene First Nations'] Dechytà Nàowo program and most recently for the NSMA. The Project Team provides annual funding to Tłıchq for training and long-term training plans will form part of an Economic Benefits Agreement that is currently in negotiations with the First Nation.</li> <li>• Female employment increased from 20% in 2021-22 to 22% in 2022-23 which remains within the target range of 15-30%.</li> <li>• The proportion of expenditures with Northern suppliers reached 61% of all the Projects expenses. The results are also higher than previous reported years (59% in 2021-22, 44% in 2019-20, 56% in 2018-2019).</li> <li>• In 2022-23, the Project Team obtained the highest training numbers registered. The total number of people trained (377) is 11% greater than the previous year (335 in 2021-22, 228 in 2022-21, and 230 in 2019-20).</li> </ul>



YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Economy (Socio-Economic) CONTINUED</b>		
2022-4	GMOB recommends that the Project Team consider changing its approach to these meetings to give more attention to the broader economics of the Project and the economic environment in which the Project is taking place. All Parties to the Agreement require better information so they can consider potential actions by their own organizations and look to the Working Group and Advisory Body meetings as opportunities to co-operate and coordinate.	<b>NOT ADDRESSED:</b> Project Team Response: GMOB and the Project Team met in May of 2023 to go over the findings that are referenced here. The Project Team agreed that further discussions are needed on GMOB's findings. The Project Team would like to work with GMOB to present and discuss these findings with the GMRP's two dedicated Socio-Economic committees. This could result in a dedicated agenda item on broader economics of the Project and the economic environment in which the Project is taking place.
2022-5	The GNWT has a far greater role and responsibilities for the economic outcomes of the Project than does the federal government, but all Parties to the Environmental Agreement have an important role. If the Socio-Economic Working Group and Advisory Body are to meaningfully contribute to the success of the Project, GMOB recommends that all Parties must attend and fully participate in meetings.	<b>NOT ADDRESSED:</b> Project Team Response: As a co-proponent, the GNWT is committed to fully participating in the meetings.
2023-1	GMOB recommends that the GMRP use its adaptive management process to address underperforming resident labour force participation, with the aim to determine the cause and to revise the Strategy accordingly. GMOB expects the actions taken by the Project Team will result in the percentage of NWT resident and Indigenous labour participating in the project to move toward and ultimately reach the top end of its target range.	<b>NOT ADDRESSED:</b> GMOB has not seen evidence of adaptive management in response to the Project's economic performance, specifically with respect to NWT resident and Indigenous labour outcomes falling short of targets.

<b>Communication, Engagement, and Reconciliation (Reconciliation/Engagement)</b>		
2016-3B 2017-4 2018-5 2019-4	Respond to the requests from the Yellowknives Dene First Nation for an apology and compensation.	<b>IN PROGRESS:</b> There has been reported progress in the negotiations between the Government of Canada and the Yellowknives Dene First Nation regarding an apology and compensation.
2021-1	To enhance project oversight activities, GMOB recommends that the Project Team undertake more active reporting on key indicators of trends in each of the seven areas: 1) Environment, 2) Economy, 3) Engagement, 4) Reconciliation, 5) Project Management and Planning, 6) Community Health and Wellness, and 7) Long-term planning.	<b>NOT ADDRESSED:</b> The Project Team stated in its response to the GMOB 2021 Annual Report recommendation that, "The Project team does not support the development of additional indicators to those that have already been developed." GMOB encourages the Project Team to continue to identify key indicators and actively report on them.
2016-3A 2017-2 2018-3	Give priority to engagement and communications with the public and the Parties to the Giant Mine Remediation Project Environmental Agreement.	<b>IN PROGRESS:</b> Public engagement and communications continue to improve although it is unclear the degree to which the general public is aware of and supports Project activities and planned outcomes.

YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Communication, Engagement, and Reconciliation (Reconciliation/Engagement)</b> CONTINUED		
2016-9 2017-3 2018-2 2019-2	Ensure all Parties to the Giant Mine Remediation Project Environmental Agreement have adequate resources to fully participate in all aspects of the Project.	<b>ADDRESSED:</b> Proposal-based funding is addressing resource needs of the various Parties.
2018-4 2019-3	More information and engagement from the City of Yellowknife that ensures citizens know about social and economic benefits.	<b>ADDRESSED:</b> The City of Yellowknife developed and regularly updates a Giant Mine information webpage.
2020-6	The City of Yellowknife make the website interactive to enable Yellowknife residents to provide their input to the Project.	<b>ADDRESSED:</b> The City of Yellowknife's webpage includes a contact email.
2020-5	Identify indicators to enable the measurement of the effectiveness of engagement and communications activities.	<b>NOT ADDRESSED:</b> The Project Team has not responded to this recommendation.
2023-2	GMOB recommends that the Project Team host meetings of the general boating community in Yellowknife, Ndı́lq and Dettah in 2024 to seek their input on the plans and schedule for the public boat launch redevelopment. The meetings should be documented, and suggestions incorporated into the Project Team's plans, and results reported in the 2024 GMRP Project Annual Report.	<b>ADDRESSED:</b> The Project Team hosted a boating session in the fall of 2024. GMOB attended the session and noted that it was not well-attended, the majority of the attendees were members of the Sailing Club, and most of the discussion related to the Sailing Club's concerns.

<b>Project Management and Planning</b>		
2016-2	Develop performance measures to enable monitoring of the Remediation Project.	<b>IN PROGRESS:</b> The Type A Water Licence granted by the Minister of Northern Affairs on September 18, 2020, in accordance with the <i>Mackenzie Valley Resource Management Act</i> , partially addressed the need for indicators. Additional work on indicators for the <i>Status of the Environment Report</i> is underway.
2016-4	Develop a Traditional Knowledge Strategy.	<b>NOT ADDRESSED:</b> The Government of the NWT funded the <i>Yellowknives Dene First Nation Traditional Knowledge Study</i> in 2017/18 but no formal traditional knowledge strategy for the Remediation Project has been released.
2016-5A	Identify foreseeable additional advanced remedial work required prior to full remediation. The team should provide appropriate justification for such work.	<b>ADDRESSED:</b> Achieved through ongoing monitoring, application of lessons learned and responsiveness to change.
2016-5B	Develop, monitor, and report on a risk profile of the site	<b>ADDRESSED:</b> Achieved through ongoing monitoring and communication of trends in the risk profile.
2016-6	Identify and mitigate delays in remediation planning.	<b>ADDRESSED:</b> Due to regulatory approvals, active remediation began in 2021.



YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Project Management and Planning</b>		
2016-10	Consider options to a government-driven and controlled approach to the Project.	<b>NOT ADDRESSED:</b> No action was taken aside from contracting the MCM.
2017-5 2018-6 2019-5	Provide a five-year project plan and critical path to link and integrate aspects of the Project.	<b>NOT ADDRESSED AND NO LONGER RELEVANT:</b> No explicit action was taken, although the Project now has regulatory authority to proceed with full reclamation within specific parameters and timelines. As such, this is no longer relevant.
2017-6 2018-7	Describe the Main Construction Manager's responsibilities.	<b>ADDRESSED:</b> Responsibilities are articulated.
2017-7	Provide results of Independent Peer Review Panel on remediation and stabilization of arsenic dust	<b>ADDRESSED:</b> The Panel provided results on one occasion
2017-8 2018-8	Complete measures five and six in the Mackenzie Valley's Environmental Impact Review Board's Report of Environmental Assessment.	<b>IN PROGRESS:</b> The Quantitative Risk Assessment is being conducted and results will be integrated on an ongoing basis into plans for the Remediation Project.
2017-9	Mackenzie Valley Land and Water Board to consider an interim water licence.	<b>NOT ADDRESSED AND NO LONGER RELEVANT:</b> Rejected by the Mackenzie Valley Land and Water Board and the Project Team. This recommendation is no longer relevant.
2021-1	To enhance project oversight activities, GMOB recommends that the Project Team undertake more active reporting on key indicators of trends in each of the seven areas: 1) Environment, 2) Economy, 3) Engagement, 4) Reconciliation, 5) Project Management and Planning, 6) Community Health and Wellness, and 7) Long-term planning.	<b>NOT ADDRESSED:</b> The Project Team stated in its response to the GMOB 2021 Annual Report recommendation that, "The Project team does not support the development of additional indicators to those that have already been developed." GMOB encourages the Project Team to continue to identify key indicators and actively report on them.
2021-3	The Project Team's annual water Licence Report will inform GMOB's project management and planning oversight activities. This report will be helpful in tracking progress, identifying deviations in schedules, and discerning trends. GMOB recommends that the Project Team identify key project management and planning indicators that can be consistently monitored and reported in the annual report and the Project Team's upcoming <i>Status of the Environment Report</i> .	<b>IN PROGRESS:</b> The Project Team stated in its response to the GMOB 2021 Annual Report recommendation that, "The Project team does not support the development of additional indicators to those that have already been developed." However, the Project Team did respond positively to this recommendation with the <i>State of Environment Report</i> and marked changes in its Annual Report to GMOB. GMOB encourages the Project Team to continue to identify key indicators and actively report on them.

YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Project Management and Planning CONTINUED</b>		
2022-7	GMOB recommends that a summary of all contingency planning exercises and reviews be included as a separate section of the <i>GMRP Annual Report</i> .	<b>NOT ADDRESSED AND NO LONGER RELEVANT:</b> GMRP response: "The Project Team completes a thorough review of its risk register on an annual basis. The risk register reviews involve ensuring the risk statements are current and accurate; reviewing likelihoods and consequence severities; and updating the project's risk responses. Contingency planning is one risk response used by the project, but other responses are also adopted, as appropriate. The risk register is an input into the Project Team's annual work planning cycle. Activities required to actively manage risk or to put in place contingencies are scoped into the annual Work Package Project Plans (WPPPs) and are implemented at the work package level. However, this is only one way in which the team addresses contingency planning. It is an activity which is inherent in the day-to-day work completed by the team as a whole as they are managing their work packages. Through regular meetings, communication, and collaboration, issues are both identified and mitigated as needed. As site managers, the MCM [Main Contract Manager] also has an important role to play. As such, the Project Team thanks the GMOB for its recommendation, but at this time does not plan to create a separate report section providing a summary of all contingency planning exercises and reviews."
2022-8	GMOB recommends that local management be provided with appropriate purchasing authority to respond to any on-site emergency situations.	<b>NOT ADDRESSED:</b> Project Team response: Should there be an emergency situation, PSPC [Public Services and Procurement Canada], along with MCM, has authority to purchase goods and services more quickly than under normal procurement processes and procedures. In this case (pump failure) the other submersible pump was able to handle the required pumping capacity and has been designed to do this as part of redundancy in the system. The time it took to replace the failed pump was not due to the lack of efficient purchasing authority, but the time required to build and deliver the replacement pump. The project has initiated the purchase of a shelf spare pump to remain at the site and will continue to ensure spares are available.

YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Project Management and Planning CONTINUED</b>		
2023-3	GMOB recommends that Project Team contingency planning include events that could affect overall site operations. The planning should include robust protocols for evacuation of the site and ensure that there is contingency planning for security and monitoring of all operational systems on the site. This planning should be completed prior to the start of significant on-site work in 2024. A summary of all contingency planning exercises and reviews is recommended as a separate section of the next <i>GMRP Annual Report</i> .	<b>ADDRESSED:</b> The Project Team released its Emergency Management and Spill Response Plan in June 2024. The Project Team has addressed GMOB's previous concerns.
2023-4	GMOB recommends that detailed information specific to the risk of arsenic release from forested site areas during a fire be incorporated into the Project Team's response plan and be communicated to all organizations and entities potentially affected by such an event.	<b>IN PROGRESS:</b> In the Emergency Management and Spill Response Plan, the Project Team has considered NWT air quality measures, but has not addressed the risk of arsenic release in the context of wildfires specifically. It has identified arsenic release as a result of fire in arsenic storage areas as an issue and has set out its contingency plans for this circumstance. GMOB encourages the Project Team to extend this approach to wildfires. That said, the differences between the response to structural fires and forest fires are significant and need to be clearly taken into account.
2023-5	GMOB recommends the City of Yellowknife, GNWT, and the Project Team immediately undertake regular, formal communications with the Parties and the public regarding their land-use planning process for the Project site, including: <ul style="list-style-type: none"> <li>• what the process looks like,</li> <li>• where they are in the process,</li> <li>• the public engagement process, and</li> <li>• their overall vision for the development of these sites.</li> </ul>	<b>NOT ADDRESSED:</b> No progress on this recommendation has been reported to GMOB.
2023-6	GMOB recommends the Project Team coordinate the development of the Perpetual Care Plan with the GMOB Research Program so that planning for the basic site requirements (space and pad) for future arsenic trioxide roaster waste treatment facilities and transformed waste material storage (pilot and full scale) is fully integrated. These treatment facilities should be included in the upcoming Site Infrastructure Design Plan (Part 2) and will also be addressed directly in the development and application of the Perpetual Care Plan.	<b>NOT ADDRESSED:</b> No progress on this recommendation has been reported to GMOB.

YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Community Health and Well-being</b>		
2016-8 2017-12 2018-11 2019-7	Deal with offsite contamination issues including land use, safety, public health, and environmental concerns.	<b>IN PROGRESS:</b> Risk assessment work and improved public engagement and communications to address these issues are progressing.
2016-12 2017-11 2018-10	Communicate effectively on studies that address arsenic contamination and risk and health studies.	<b>IN PROGRESS:</b> Improved public engagement and communications are progressing to address these issues.
2018-4 2019-3	Improve the City of Yellowknife's engagement of local residents in all aspects of the Remediation Project.	<b>ADDRESSED:</b> The City of Yellowknife has developed and regularly updates its Giant Mine information webpage which includes a contact information webpage which includes a contact email.
2020-7	Continue to improve engagement and communications activities to ensure that local people: a) are not experiencing unnecessary stress or fear due to dust coming off the Giant Mine site, and b) understand the three main types of site remediation standards – residential, industrial, undisturbed – and how they apply to the site.	<b>IN PROGRESS::</b> Improved public engagement and communications are progressing to address these issues.
2021-1	To enhance project oversight activities, GMOB recommends that the Project Team undertake more active reporting on key indicators of trends in each of the seven areas: 1) Environment, 2) Economy, 3) Engagement, 4) Reconciliation, 5) Project Management and Planning, 6) Community Health and Wellness, and 7) Long-term Planning.	<b>NOT ADDRESSED:</b> The Project Team stated in its response to the GMOB 2021 Annual Report recommendation that, "The Project team does not support the development of additional indicators to those that have already been developed." GMOB encourages the Project Team to continue to identify key indicators and actively report on them.

YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Community Health and Well-being CONTINUED</b>		
2022-9	In light of the discontinuation of the <i>Hoèla Weteèts'eèdeè Understanding Community Well-being around Giant Mine Study</i> , GMOB recommends that the Project Team request direction from the Mackenzie Valley Environmental Impact Review Board (MVEIRB), the responsible Ministers, and the Parties to the Agreement regarding Measure #10 and the evaluation of broader health impacts such as stress effects.	<p><b>ADDRESSED:</b> Members of the Advisory Committee, including all Environmental Agreement Signatories, are the following:</p> <ul style="list-style-type: none"> <li>• Wilfrid Laurier University,</li> <li>• the City of Yellowknife,</li> <li>• the North Slave Métis Alliance,</li> <li>• the Giant Mine Oversight Board,</li> <li>• Alternatives North,</li> <li>• Health Canada,</li> <li>• the Government of the Northwest Territories Department of Health and Social Services, and</li> <li>• Crown-Indigenous Relations and Northern Affairs Canada</li> </ul> <p>After careful deliberation, the Advisory Committee unanimously advised on September 15, 2022 that the Project Team and research team should no longer proceed with the study. As such, the Project Team made the difficult decision to discontinue the wellness study. However, it is the Project Team's understanding that YKDFN may be interested in carrying out their own independent wellness study. The Project Team's response letter to YKDFN of November 16, 2022 expressed the Project Team's willingness to discuss further, however no conversations have occurred. At this time the Project Team does not feel it's appropriate to push or pursue this further. YKDFN is best positioned to speak to their decision and next steps.</p>

YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Community Health and Well-being CONTINUED</b>		
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YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Engagement</b>		
2016-3A 2017-2 2018-3	Give priority to engagement and communications with the public and the Parties to the Giant Mine Remediation Project Environmental Agreement.	<b>IN PROGRESS:</b> Public engagement and communications continue to improve although it is unclear the degree to which the general public is aware of and supports Project activities and planned outcomes.
2016-9 2017-3 2018-2 2019-2	Ensure all Parties to the Giant Mine Remediation Project Environmental Agreement have adequate resources to fully participate in all aspects of the Project.	<b>ADDRESSED:</b> Proposal-based funding is addressing resource needs of the various Parties.
2018-4 2019-3	More information and engagement from the City of Yellowknife that ensures citizens know about social and economic benefits.	<b>ADDRESSED:</b> The City of Yellowknife developed and regularly updates a Giant Mine information webpage.
2020-6	The City of Yellowknife make the website interactive to enable Yellowknife residents to provide their input to the Project.	<b>ADDRESSED:</b> The City of Yellowknife's webpage includes a contact email.
2020-5	Identify indicators to enable the measurement of the effectiveness of engagement and communications activities.	<b>NOT ADDRESSED:</b> The Project Team has not responded to this recommendation.
2021-1	To enhance project oversight activities, GMOB recommends that the Project Team undertake more active reporting on key indicators of trends in each of the seven areas: 1) Environment, 2) Economy, 3) Engagement, 4) Reconciliation, 5) Project Management and Planning, 6) Community Health and Wellness, and 7) Long-term Planning.	<b>NOT ADDRESSED:</b> The Project Team stated in its response to the <i>GMOB 2021 Annual Report</i> recommendation that, "The Project team does not support the development of additional indicators to those that have already been developed." GMOB encourages the Project Team to continue to identify key indicators and actively report on them.

<b>Long-term Planning</b>		
2017-8	Complete measure six in the Mackenzie Valley's Environmental Impact Review Board's Report of Environmental Assessment.	<b>ADDRESSED:</b> Achieved through ongoing monitoring, application of lessons learned and responsiveness to change.
2019-6	Use legislation to guarantee long-term funding.	<b>NOT ADDRESSED:</b> No progress has been made on long-term funding.
2019-8	Develop a land-use plan for the site.	<b>NOT ADDRESSED:</b> No progress has been made to develop an onsite land use plan.
2020-4	Ensure northerners have central roles in the care, maintenance, and management of the Giant Mine site into the future.	<b>NOT ADDRESSED:</b> The development of a PCP continues to be delayed.
2021-1	To enhance project oversight activities, GMOB recommends that the Project Team undertake more active reporting on key indicators of trends in each of the seven areas: 1) Environment, 2) Economy, 3) Engagement, 4) Reconciliation, 5) Project Management and Planning, 6) Community Health and Wellness, and 7) Long-term planning.	<b>NOT ADDRESSED:</b> The Project Team stated in its response to the GMOB 2021 Annual Report recommendation that, "The Project team does not support the development of additional indicators to those that have already been developed." GMOB encourages the Project Team to continue to identify key indicators and actively report on them.



YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Long-term Planning CONTINUED</b>		
2021-4	It is expected that a request for proposals to develop a Perpetual Care Plan will be issued by May 2022. GMOB is hopeful that inefficiencies associated with a committee-based approach to drafting the request for proposals will not create further delays. GMOB strongly recommends that the Project Team permit no further delays in the preparation of an appropriate Perpetual Care Plan.	<b>NOT ADDRESSED AND NO LONGER RELEVANT:</b> The RFP for the PCP was tendered in early 2024, and the contract was signed in summer of 2024.
2022-10	GMOB recommends that the Perpetual Care Plan be completed and submitted to GMOB for review no later than March 31, 2024.	<b>NOT ADDRESSED:</b> Project Team response: The Project Team agreed that the PCP development is very important and recognizes that it is behind the schedule set out in the Agreement. However, this schedule was arbitrary and defined before a full project implementation schedule was realized; a final PCP is not needed until the site remediation is complete (currently scheduled for 2038). That said, the Project Team has worked closely with Rights holders and stakeholders over the past several years to develop an inclusive scope of work and has issued a Request for Information on CanadaBuys to assess interest within the contracting community and further refine the RFP. The Project Team expects the first version of the PCP to be completed by 2024-25.  <b>NOT ADDRESSED:</b> <i>GMRP Draft Annual Report:</i> Table 26, page 123 Section 2.2 Perpetual Care Plan page 28. The Project Team, with significant input from the Task Force, developed a Scope of Work which outlines the requirements of Version 1 of the PCP. This supplements a Request for Information to inform a final RFP to be issued in 2023-24, with a contract award anticipated by fall of 2023.
2023-7	GMOB recommends the Project Team include a representative of the GMWG in the evaluation process to select the successful contractor for the development of the draft PCP. The GMWG should be involved in the review of draft documents as the contract progresses.	<b>NOT ADDRESSED:</b> The Project Team asked GMOB to sit on the evaluation Team. GMOB declined the invitation stating that it would be a conflict as the Board will be reviewing the final PCP. The Project did not reach out to any other Parties.



YEAR and RECOMMENDATION #	TOPIC	STATUS
<b>Long-term Planning</b> CONTINUED		
2023-8	<p>GMOB recommends to the GNWT, the City of Yellowknife, and the Project Team that on-site land use planning occur in tandem with active remediation and be led by the City of Yellowknife. Parallel land use planning and remediation processes provide greater opportunities to:</p> <ul style="list-style-type: none"> <li>• Mitigate risks of closing off options for a permanent solution to the arsenic trioxide dust.</li> <li>• Align remediation plans with desired post-closure access and use of the site.</li> <li>• Make cost-effective adjustments that may be impossible or impractical after remediation is completed.</li> </ul>	<b>NOT ADDRESSED:</b> Neither the City of Yellowknife nor the GNWT have begun the land use planning exercise for the site. GMOB notes that the Project Team provided the City with a post-closure land-use constraints map, but that this map has not been shared publicly.
2023-9	GMOB recommends that the Project Team provide to GMOB the expected completion date of the PCP.	<b>NOT ADDRESSED:</b> The PCP RFP was issued and the contractor was chosen in 2024. The work to complete the PCP is contracted for 33 months with an end date of March 31, 2027, and a budget of \$1.89 million. GMOB understands that the contracted end date is for submission of the first draft of the PCP.

# APPENDIX B

## GMOB Annual Report of Activities

January 11, 2024 – December 10, 2024

### GMOB BUDGET 2024-2025

The GMOB budget for 2024-2025 is \$1,096,601.00 per the CIRNAC grant, including a +1.9% NWT CPI adjustment over the previous year.

- The Core Operations budget for 2024-2025 is \$792,315.00 or 72% of the total budget.
- The Research Program budget for 2024-2025 is \$304,268.00 or 28% of the total budget.

The GMOB Research Program account holds carry-over funds allocated to the GMOB Research program as approved by the Board. These surplus funds are held in short-term GICs. As of November 29, 2024, a total of \$384,000.11 is held in three GIC accounts.

### GMOB WORK PLAN 2023-2024

- The 2024-2025 GMOB work plan was submitted to CIRNAC on February 28, 2024, and can be found in Appendix 1.
- The mandated GMOB meetings 2024-2025 can be found in Appendix 2.
- The list of meetings attended by GMOB Directors and staff during the designated period can be found in Appendix 3.

### GMOB BOARD MEMBER TERMS

Board Member	Beginning of Current Term	End of Current Term	Nominating Party
David Livingstone	September 1, 2024	March 1, 2025	Alternatives North
Ken Hall	September 1, 2024	August 31, 2025	GNWT
Adrian D’Hont	November 14, 2024	November 13, 2025	NSMA
Marc Lange	September 1, 2021	August 31, 2025	YKDFN
Graeme Clinton	September 13, 2021	September 12, 2025	City of Yellowknife
Mark Palmer	September 1, 2023	August 31, 2027	Government of Canada
Ken Froese	November 14, 2020	November 13, 2024	NSMA

## **GMOB ACTIVITY SUMMARY**

### ***Regulatory and Document Reviews***

- Erosion and Sediment MMP, version 3.0
- Borrow Design Plan, Version 1.1
- Aquatic Effects Monitoring Program 2023 Annual Report
- Open Pits Design Plan Version 1.0
- Water Treatment Plan Construction Plan, Revision 2
- 2023 Annual Geotechnical Inspection
- Closure and Reclamation Plan – Annual Update
- 2022 Aquatic Effects Monitoring Program Response Plan – Close Out Report
- 2024 Aquatic Effects Monitoring Program Re-evaluation Report
- Water Management and Monitoring Plan Version 5.0
- 2023 Water Licence Annual Report
- Annex A SNP Proposed Updates
- Fisheries Act Authorization, Version 1.0
- GMRP Annual Report to GMOB
- Transport Canada Authorization
- Climate Change Memo – AR6 Climate Change Report
- Climate Change Memo – AR6 Review
- Working Group documents
- Non-hazardous Waste Landfill – As-built Report
- Emergency Management and Spill Response Plan Revision 1
- Land Use Inspector - Inspection Reports
- Land Use Inspector Notifications – various activities (e.g. spills, construction updates)
- YkHemp tracking and reporting

## **ONGOING MONITORING:**

- Inspection Reports
- Air Quality Monitoring Program Reports
- Surveillance Network Program Reports
- Site Activity Notifications to the Land Use Inspector (e.g. spills, construction updates, etc.)

## **MONITORING THE DEVELOPMENT OF:**

- GMRP Socio-Economic Action Plan
- GMRP Socio-Economic Engagement Plan
- Giant Mine Land Use Plan
- Giant Mine Boat Launch Plan

## **GMOB 2024 ANNUAL REPORT**

- 2024 05 07 release of GMOB 2023 Annual Report.

## **GMOB ECONOMICS**

- GMOB provided CIRNAC with GMRP economic results (May 10, 2023)
- Auditor General of Canada Report: Contaminated Sites Northern Canada (April 30, 2024)
- GMOB work to better understand the GMRP training record
- Examination of detailed calculations of recorded training hours
- Meeting with Dechîta Nàowo and a subsequent meeting with the GNWT
- Follow up with 2023-24 data to learn of trends in reported training hours
- City of Yellowknife meeting to discuss their views of opportunities and challenges re the GMRP
- Follow up meeting with City to discuss resident and business participation

***Continued ►***

## **GMOB ECONOMICS CONTINUED**

- Investigation into the nature of Joint Venture partnerships contracted at GMRP
- Meeting with GNWT officials to discuss growing the economic benefits of the GMRP
- Calculated 2023-24 employment record from raw data for comparison with reported results

## **GMOB PERPETUAL CARE PLAN (PCP)**

- PCP revision was November 9, 2022.
- PCP Task Force Confidentiality Declaration signed (December 16, 2022)
- RFP submissions for the PCP reviewed.
- The successful contractor received the contract to sign on June 3, 2024.
- The PCP Task Force last met on October 31, 2024.

## **GIANT EDUCATIONAL MODULE**

- Last meeting was May 1, 2023
- There is currently no contractor retained by GMOB for this initiative.

## **GMOB ENGAGEMENT AND COMMUNICATIONS**

GMOB administration continues to provide online information to the public seeking information about the Board, its activities, and the status of the remediation project. The office is open for public and educational tours.

- GMOB Board directors and staff during this reported period attended 147 meetings and engagement sessions (listed in Appendix 2)
- The GMOB engaged in four media sessions (CBC North, CKLB, Cabin Radio and APTN)
- The GMOB website and archive updates are ongoing.

## **GMOB RESEARCH PROGRAM**

GMOB has signed a new research agreement with TERRE-NET through the University of Waterloo. The focus of the research program narrowed in 2024 to speciation of the newly collected samples and vitrification. All streams of research under Alliance funding have reported progress and will continue.

## **DUNDEE TECHNOLOGIES AND UNIVERSITY OF WATERLOO**

GMOB and lead researchers from the University of Waterloo met with Dundee Sustainable Technologies facilities in May 2024 to share research results on the current vitrified glass samples. Dundee is contracted to supply a new sample of glass with the intention of further improving the results of the leach testing.

## **GMOB RESEARCH STRATEGY**

GMOB has completed the plain language GMOB Research plan with the assistance of Fuse Consulting. The strategy will be shared in early 2025.

### ***Unsolicited Submissions***

GMOB received an unsolicited research proposal from Yakum Consultants. An Independent Advisory Group (IAG) reviewed its proposal and made a recommendation to the Board. The Board asked for more information from Yakum which was provided in January 2023. In 2024 GMOB put aside the proposal after IP negotiations with Barrick Gold, which holds the patent for the process, did not respond.

GMOB proceeded with a research application from the Geological Survey of Denmark and Greenland and signed a material transfer agreement in May 2024. These samples were tested for arsenic extraction and are to be shared with the TERRE-NET research team in 2025.

### ***Arsenic Samples***

GMOB shipped the GMRP extracted samples to SGS in Lakefield, Ontario on April 5, 2024. There is a 20-year storage and handling agreement now in place and all samples have been catalogued.

# APPENDIX 1 to the GMOB Annual Report of Activities

## GMOB Work Plan 2024-2025

	2024-25	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
ENGAGEMENT	<b>GMOB Observation/Participation (as scheduled)</b>												
	Giant Mine Working Group												
	Giant Mine Advisory Committee												
	Socio Economic Working Group												
	Socio Economic Advisory Body					AS REQUIRED							
	YK Health Effect Monitoring Program Advisory Committee												
	Aquatics Advisory Committee												
	GMRP Education Module Advisory Group												
	Giant Mine Project Team Community Sessions												
	Relevant meetings as required												
ADMINISTRATION	<b>Board Business</b>												
	GMOB Meetings												
	GMOB Annual Report												
	GMOB Annual Public Meeting												
STOREFRONT	<b>Operations</b>												
	GMOB Administration												
	GMOB Public Displays and Storefront												
	GMOB Website												
COMMUNICATIONS	<b>Communications</b>												
	GMOB Community Communications												
RESOURCE LIBRARY	<b>Inhouse and Online Archive</b>												
	Research and Cataloguing Archive Documents												
REGULATORY	<b>Regulatory Reviews</b>												
	Review/comment on Design and MMPs					AS REQUIRED							
RESEARCH	<b>GMOB Research Program</b>												
	GMOB–TERRE-NET Research Program												
	GMOB Research Program Expert Review Panel												
REVIEW	<b>GMOB Review of Deliverables</b>												
	GMRP Annual Report												
	YK HEMP Program												
	GMRP Engagements												
	GMRP Economic Strategy												
	GMRP Perpetual Care Plan												
	Offsite HHERA					AS REQUIRED							
	DFO/Transport Canada												
	Regulatory Documents												
	Additional Reports and Studies												
MANDATED	<b>Meetings as per Environmental Agreement:</b>												
	Parties Semi-Annual Meeting												
	GMOB Annual General Meeting												
	Co-Proponent's Meeting with GMOB												
	Co-Proponent's Public Meeting (re: Annual Report)												

## APPENDIX 2 to the GMOB Annual Report of Activities

### GMOB-Mandated Meetings\* 2023-2024

May TBA, 2025	GMOB and Parties	Section 9.1 GMRPEA*	Bi-annual
May TBA, 2025	Co-Proponents	Section 3.4 d GMRPEA	Annual
May TBA, 2025	GMOB and Public	Section 5.5 GMRPEA	Annual
December 10, 2024	GMOB and Parties	Section 9.1 GMRPEA	Bi-annual
December 10, 2024	Annual General Meeting	Societies Act of NWT	Annual

*\*Giant Mine Remediation Project Environmental Agreement*

## APPENDIX 3 to the GMOB Annual Report of Activities

### Meetings attended by GMOB

GMOB organized, participated in and/or attended a total of 147 meetings from January 11 – December 10, 2024

No.	Date	Host	Subject	Community
1	2024 01 11	GMOB	GMOB AGM	Yellowknife
2	2024 01 11	GMOB	GMOB Semi-Annual Meeting	Yellowknife
3	2024 01 14-16	GMOB	GMOB 2023 Annual Report Writing Workshop	Victoria, BC
4	2024 01 22	GMOB	Fuse Consulting – Plain Language	Online
5	2024 01 23	GMOB	GMOB – UBC GMOB Research Program	Vancouver, BC
6	2024 02 01	GMOB	RFS – UofGuelph Climate Change (CCAP)	Online
7	2024 02 05	GMOB	2023 Annual Report recommendations	Online
8	2024 02 06	GMOB	GMOB- Fuse Annual Report recommendations	Online
9	2024 02 08	GMRP	GM Working Group	Online
10	2024 02 09	GMOB	GMOB – Alternatives North Climate Change	Yellowknife
11	2024 02 14	GMOB	2023 Annual Report recommendations	Online
12	2024 02 15	GMOB	GMOB – Verge Communications CKAN Archive	Yellowknife
13	2024 02 16	GMOB	GMOB Budget 2024-2025	Yellowknife
14	2024 02 19	GMRP	GMRP – YK Historical Society meeting	Yellowknife
15	2024 02 20	GMRP	Socio-Economic Working Group	Yellowknife

No.	Date	Host	Subject	Community
16	2024 02 20	Aurora College	Environmental Monitoring course	Yellowknife
17	2024 02 21	Aurora College	Project Management course development	Yellowknife
18	2024 02 21	GMOB	Gaea Consulting 2023 Annual Report draft	Online
19	2024 02 22	ITI - GNWT	Remediation Economic Opportunities	Yellowknife
20	2024 02 23	GMOB	YKDFN BEHR display presentation	Yellowknife
21	2024 02 26	GMOB	GMOB – RFS – UofGuelph (CCAP)	Online
22	2024 02 27	GMOB	GMOB Board Meeting	Yellowknife
23	2024 02 28	GMOB	GMOB – Terre-Net GMOB Research Program	Online
24	2024 02 29	GMOB	Fuse GMOB Research Strategy Plain Language	Online
24	2024 03 04	GMOB	GMOB – City of YK - Economic meeting	Yellowknife
25	2024 03 05	GMOB	GMOB – Verge Communications CKAN Archive	Yellowknife
26	2024 03 06	GMRP	GMOB – GMRP Virtual Reality event	Yellowknife
27	2024 03 11	GMOB	GMOB – RFS – UofGuelph (CCAP)	Online
28	2024 03 13	GMOB	GMOB – Parlee Legal YKHEMP	Online
29	2024 03 14	GMOB	GMOB – Verge Communications CKAN Archive	Yellowknife
30	2024 03 20	GMOB	GMOB - UBC- GSD GMOB Research Program	Online
31	2024 03 25	GMOB	GMOB – RFS – UofGuelph (CCAP)	Online
32	2024 03 26	YKHSociety	YKHSociety Museum opening	Yellowknife
33	2024 03 27	GMOB	GMOB Board Meeting	Yellowknife
34	2024 04 03	GMOB	GMOB - UBC- GSD GMOB Research Program	Online
35	2024 04 09	GMOB	Fuse GMOB Research Strategy Plain Language	Online
36	2024 04 15	GMOB	GMOB – GMRP GMOB recommendations	Online
37	2024 04 15	GMOB	GMOB – Verge Communications CKAN Archive	Yellowknife
38	2024 04 18	GMOB	Fuse GMOB Research Strategy Plain Language	Online
39	2024 04 22	GMOB	GMOB – RFS – UofGuelph (CCAP)	Yellowknife
40	2024 04 23	GMRP	Socio-Economic Advisory Group	Yellowknife
41	2024 04 25	GMRP	GMOB – GMRP NC Site Program	Yellowknife
42	2024 04 25	GMOB	Fuse GMOB Research Strategy Plain Language	Online
43	2024 04 25	Alternatives North	Alternatives North Earth Week presentation	Yellowknife
44	2024 04 29	GMOB	GMOB – Terre-net GMOB Research Program	Online
45	2024 05 01	GMOB	GMOB – SGS Sample Storage	Online
46	2024 05 03	University of Ottawa	HEMPAC	Online
47	2024 05 06	GMOB	Audit preparation meeting	Online



No.	Date	Host	Subject	Community
48	2024 05 06	GMOB	GMOB – RFS – UofGuelph (CCAP)	Online
49	2024 05 06	GMOB	Dundee Technologies –Research Program	Online
50	2024 05 07	GMOB	GMOB Research Program	Yellowknife
51	2024 05 09	GMRP	GM Working Group Meeting	Online
52	2024 05 09	GMOB	CKLB, Cabin Radio - advertising	Yellowknife
53	2024 05 10	GMOB	GMOB – Cabin Radio interview	Yellowknife
54	2024 05 17	GMOB	Yakum – GMOB Research Program	Online
55	2024 05 21	GMOB	Aurora Science Institute meeting	Yellowknife
56	2024 05 21	GMOB	Aurora College presentation	Online
57	2024 05 22	GMOB	GMOB – RFS – UofGuelph (CCAP)	Online
58	2024 05 23	GMOB	GMOB – Terre-net GMOB Research Program	Online
59	2024 05 24	GMOB	GMOB APTN interview	Yellowknife
60	2024 05 27	GMOB	GMOB – CanNor Meeting	Yellowknife
61	2024 05 28	GMOB	YKDFN BEHR display presentation	Yellowknife
62	2024 05 28	GMOB	GMOB Legal Yakum legal	Yellowknife
63	2024 05 29	GMRP	Site Blessing Water Treatment Plant	Giant Mine
64	2024 05 30	GMOB	GMOB Board Meeting	Yellowknife
65	2024 05 30	GMOB	GMOB Annual Public Meeting	Yellowknife
66	2024 05 31	GMOB	GMPR – Co-proponents meeting	Yellowknife
67	2024 05 31	GMOB	GMOB Semi-Annual Meeting	Yellowknife
68	2024 06 03	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
69	2024 06 04	GMOB	GMOB Parlee – Legal Meeting	Online
70	2024 06 05	GMOB	GMOB – Dundee Sustainable Tech	Online
71	2024 06 06	GMOB	GMOB Rotary Club presentation	Yellowknife
72	2024 06 10	GMOB	Cabin Radio interview	Yellowknife
73	2024 06 11	GMOB	GMRP Public Boat Launch Meeting	Yellowknife
74	2024 06 12	GMOB	Indigenous Centre Cumulative Effects presentation	Yellowknife
75	2024 06 12	GMOB	GMOB presentation College Nordique	Yellowknife
76	2024 06 13	GMOB	Giant Mine Working Group Meeting Site Tour	Online/Onsite
77	2024 06 13	GMOB	GMOB Research Strategic Plan	Online
78	2024 06 14	GMOB	GMOB–Aurora College Meeting	Yellowknife
79	2024 06 17	GMOB	GMOB Board Meeting-Auditor	Yellowknife
80	2024 06 17	GMRP	GMOB-GMRP AEMP meeting	Online
81	2024 06 17	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
82	2024 06 17	GMOB	GMOB Archive program	Yellowknife
83	2024 06 18	GMRP	GMOB-GMRP AEMP meeting	Online



No.	Date	Host	Subject	Community
84	2024 06 18	GMRP	GMOB-GMRP Socio-Economic Working Group	Yellowknife
85	2024 06 18	GMOB	GMOB Research Program	Online
86	2024 06 19	GMOB	GMOB – GNWT Economic Meeting	Yellowknife
87	2024 07 03	GMOB	GMOB Research Program - Vitrification	Online
88	2024 07 11	GMOB	GMOB Research Strategy Meeting	Online
89	2024 07 15	GMOB	GMOB – Auditor Meeting	Online
90	2024 07 15	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
91	2024 07 22	GMOB	GMOB – NSMA Meeting	Yellowknife
92	2024 07 25	GMOB	GMOB Research Strategy Meeting	Online
93	2024 07 26	GMOB	GMOB Research Program – U of W	Online
94	2024 07 30	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
95	2024 07 30	GMOB	GMOB Board Meeting	Yellowknife
96	2024 08 08	GMOB	GMOB Research Program – U of W	Online
97	2024 08 08	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
98	2024 08 13	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
99	2024 08 15	GMOB	GMOB Research Program - Vitrification	Online
100	2024 08 27	GMRP	GMOB-GMRP Socio-Economic Working Group	Yellowknife
101	2024 08 29	GMOB	GMOB Board Meeting - Economic	Yellowknife
102	2024 08 29	GMOB	GMOB – GNWT Executive Meeting	Yellowknife
103	2024 09 04	GMOB	GMOB Economic Meeting	Yellowknife
104	2024 09 06	GMOB	GMOB – GNWT Executive Meeting	Yellowknife
105	2024 09 10	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
106	2024 09 11	GMOB	GMOB Finance Meeting	Yellowknife
107	2024 09 11	GMOB	GMOB – Legal Dundee Agreement	Yellowknife
108	2024 09 12	GMOB	GMOB Research Strategy Meeting	Online
109	2024 09 13	GMOB	GMOB Economic Meeting	Yellowknife
110	2024 09 16	GMOB	GMOB – Artless Collective – Drone Shoot	Online
111	2024 09 17	GMRP	GMRP Socio-Economic Working Group	Yellowknife
112	2024 09 17	GMOB	Climate Change Working Group	Yellowknife
113	2024 09 20	GMOB	Working Condition at Site (public)	Yellowknife
114	2024 09 20	GMOB	GMOB – PSAC Health & Safety	Yellowknife
115	2024 09 24	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
116	2024 09 24	GMOB	GMOB – Arless Collective Site Orientation	Yellowknife
117	2024 09 25	GMOB	GMOB – Artless Collective Drone Shoot	Yellowknife
118	2024 10 01	GMOB	GMOB Board Meeting	Yellowknife
119	2024 10 07	GMOB	GMOB Research Strategy Meeting	Online

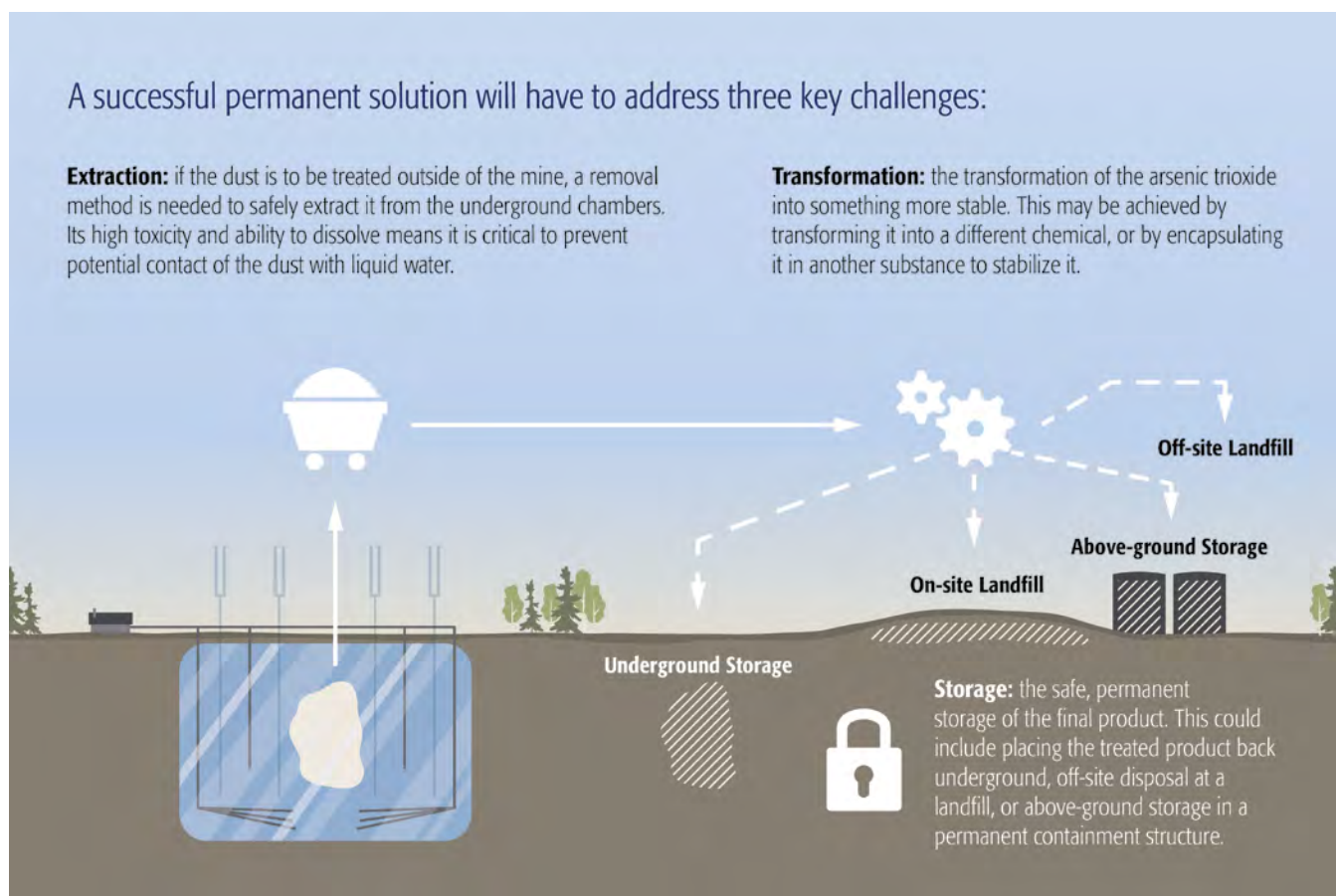
No.	Date	Host	Subject	Community
120	2024 10 08	GMOB	GMOB Interview (Wall Street Journal)	Yellowknife
121	2024 10 08	GMOB	GMOB Annual Report Workshop Meeting	Yellowknife
122	2024 10 09	GMOB	Lidar Data Presentation	Online
123	2024 10 10	GMRP	GMRP Working Group	Yellowknife
124	2024 10 11	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
125	2024 10 16	GMOB	GMOB-YKDFN Presentation	Yellowknife
126	2024 10 17	GMOB	GMOB Human Resources	Yellowknife
127	2024 10 19	GMOB	GMOB Human Resources	Yellowknife
128	2024 10 21	GMOB	GMOB Human Resources	Yellowknife
129	2024 10 22	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
130	2024 10 24	GMOB	GMOB BEHR Presentation	Yellowknife
131	2024 10 24	GMOB	GMRP Economics McMaster U Student	Yellowknife
132	2028 10 28	GMOB	GMOB Presentation (Public)	Yellowknife
133	2024 10 30	GMOB	GMOB Human Resources	Yellowknife
134	2024 10 31	GMOB	GMOB Human Resources	Yellowknife
135	2024 11 08	GMOB	GMOB Human Resources	Yellowknife
136	2024 11 13	GMOB	Research Program Legal Meeting	Online
137	2024 11 13	YKHEMP	YKHEMP Community Meeting	Yellowknife
138	2024 11 14	GMOB	GMOB-Dundee Research Program	Online
139	2024 11 19	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
140	2024 11 25	GMOB	GMOB Research Program – U of W	Waterloo, ON
141	2024 11 28	GMOB	GMOB Annual Report Workshop	Online
142	2024 12 03	GMRP	GMRP Socio Economic Working Group	Yellowknife
143	2024 12 03	GMOB	GMOB-RFS-UofGuelph (Climate Change)	Online
144	2024 12 06	GMOB	GMOB – Dundee Research Program	Online
145	2024 12 09	GMOB	GMOB Board Meeting	Yellowknife
146	2024 12 10	GMOB	GMOB AGM	Yellowknife
147	2024 12 10	GMOB	GMOB Semi-Annual Meeting	Yellowknife

## APPENDIX C

### Overview of GMOB Funded Research NOVEMBER 2023 REPORT, UPDATED MARCH 2024

Article 7 of the Giant Mine Remediation Environmental Agreement tasks GMOB with undertaking research into technical approaches that do not require constant and forever care and maintenance of the arsenic trioxide at the mine site. As shown in the figure below, a permanent solution must tackle three key challenges: extraction of the dust, transformation to a much less toxic material, and safe storage of the final product.

#### KEY CHALLENGES TO ADDRESS FOR A PERMANENT SOLUTION TO ARSENIC TRIOXIDE DUST STORED UNDERGROUND AT GIANT MINE



#### BACKGROUND

In 2018, GMOB partnered with TERRE-NET, an integrated network of leading academics from universities across Canada who work toward managing mine waste and mitigating contamination from mining operations. One of TERRE-NET's goals is to find sustainable ways to deal with environmental challenges associated with the resource sector, including the management of hazardous wastes from mines. These experts work in various scientific and social science fields.

TERRE-NET is headquartered at the University of Waterloo. GMOB has asked TERRE-NET to focus on technology that will transform the arsenic trioxide into a stable, much less toxic material.

**A SUMMARY OF THE RESEARCH PROJECTS AND PROGRESS TO DATE.**

## Understanding the makeup of the arsenic dust at Giant Mine

**PRESENTED BY**

- Matthew Lindsay, Associate Professor, Department of Geological Sciences, University of Saskatchewan
- Heather Jamieson, Professor Emerita, Department of Geological Sciences & Geological Engineering, Queen's University

The arsenic dust currently stored underground at Giant Mine presents a serious environmental challenge. The dust is one of the by-products that were produced when rocks that naturally contained gold, arsenic and sulfur were mined and roasted at extremely high temperatures to extract the gold.

The dust contains large amounts of arsenic trioxide, a dangerous substance that dissolves in water, but it also contains iron, calcium, sulfur and more. These additional elements, which were present naturally in the mined rock, cause the dust to behave differently from pure arsenic trioxide. These differences affect how the dust can be treated so that it is stable for the long term.

**The project has two goals. The first goal is to gain a clear picture of the dust's chemical and physical properties. The second goal is to learn how the dust dissolves in the different types of water that exist in and near the Giant Mine (e.g., lake water or groundwater).**

The first step is to closely examine the arsenic dust using specialized equipment to gain a better picture of what exactly is in it. The dust's composition has implications for how it behaves and reacts, both in the environment and when it is transformed and stored for the long term.

The next step is to test how the arsenic dust dissolves in water under different environmental conditions such as fresh lake water or salty groundwater from deep underground. The results from these tests will help explain why the dust behaves the way it does, both in the environment and in potential remediated products (e.g., when mixed with cement or transformed to glass)

### PROJECT UPDATE

**RESEARCH PROGRESS: 90%**

**Where we are now:** This was the first project initiated in this research program, and it is nearly complete. The first step, understanding the dust's properties, is complete and a scientific paper describing these results has been [published](#). Experimental work for the second step (examining how the dust dissolves in water) is complete, but samples are being re-analyzed due to some inconsistencies. Overall, findings suggest that arsenic dust does not dissolve as easily when it contains higher amounts of antimony.

**What comes next:** Once re-analysis is complete, the results of dissolving the dust in water under different conditions will be described in a second scientific paper. Once published, this project will be complete.

## Understanding the long-term stability of iron arsenic solids

### PRESENTED BY

- Matthew Lindsay, Associate Professor, Department of Geological Sciences, University of Saskatchewan
- Heather Jamieson, Professor Emerita, Department of Geological Sciences & Geological Engineering, Queen's University

As the GMOB research program is exploring several different ways to stabilize the underground arsenic dust, one very common way of treating arsenic waste materials – specifically, arsenic dissolved in water – is to add an iron-rich compound. This process removes the arsenic from the water and forms iron-rich solids, such as scorodite, that contain the arsenic.

However, there are many knowledge gaps around the long-term stability of iron-arsenic solids, both when stored aboveground for decades and when conditions change through remediation (e.g., if they are covered in soil and planted over). These knowledge gaps have implications for not only potential treatments for the arsenic dust at Giant Mine, but also for any treatment process that produces these solids as a by-product.

**The goal of this project is to learn more about the long-term stability of iron-arsenic solids by exposing them to a range of environmental conditions and studying what physical and chemical changes might occur.**

The first step is to produce iron-arsenic solids in the lab, then examine them using special equipment such as the Canadian Light Source Synchrotron to understand their composition. The second step is to expose the solids to a range of conditions. These conditions include exposure to soil, water with different acidity levels, both oxygen-rich and oxygen-poor conditions, and microbes that occur naturally around the mine. These tests will shed light on how different possible reclamation scenarios might affect the long-term stability of the iron-arsenic solids.

### PROJECT UPDATE

#### RESEARCH PROGRESS: 50%

**Where we are now:** The research team has produced iron-arsenic solids and performed initial tests to get a better picture of their chemical and physical makeup. They have collected solids from a water treatment settling pond at Giant Mine for comparison. Synchrotron analysis has been delayed due to unexpected maintenance.

**What comes next:** The work is continuing as researchers prepare to begin testing the samples under a range of environmental conditions, performing the microbial tests and closely studying any changes that might occur to the solids.

## Turning arsenic dust into a mineral that won't dissolve in water

### PRESENTED BY

- Tom Al, Professor, Department of Earth and Environmental Sciences, University of Ottawa

Arsenic sulfide is up to 10,000 times less soluble than arsenic trioxide and could provide a safe and permanent solution when stored underwater, deep in the mine.

**The goal of this project is to “trap” the arsenic in a more stable mineral called “arsenic sulfide”.**

In its current form, the arsenic trioxide is simply arsenic “linked” to oxygen. The first step is to dissolve the arsenic trioxide in water to break the arsenic free from the oxygen. Like adding sugar to tea, heating the water is important to ensure it dissolves completely. The most important challenge for the research team is figuring out how hot the water needs to be, and for how long, to completely dissolve all the arsenic trioxide.

Next, the researchers add sulfides to the dissolved mixture. This process, called “sulfidation,” traps the arsenic in arsenic sulfide. After dissolving the arsenic trioxide, a small amount of “residue” remains. Studying this residue is another important phase of this project to determine if it needs to be treated and how that could be done.

Should arsenic sulfide be used in a permanent solution, it would be important to keep it away from oxygen so new arsenic trioxide doesn't form, meaning it would need to be stored underwater in the deepest part of Giant Mine.

### PROJECT UPDATE

#### RESEARCH PROGRESS: 75%

**Where we are now:** Researchers now have a good idea of the temperature and time needed to dissolve the arsenic dust in water. Their key finding is that the water will need to be 200°C or higher. They have also characterized the residues to determine how much arsenic and other minerals they contain.

**What comes next:** Researchers are focusing on 1) optimizing the sulfidation process and 2) testing the stability of the arsenic sulfide that it produces.



## Using bacteria from the environment to produce an essential ingredient for stabilizing arsenic

### PRESENTED BY

- Carol Ptacek, Professor, Department of Earth and Environmental Sciences, University of Waterloo

One potential option for safe, permanent storage is to dissolve the arsenic dust in water and combine the arsenic with sulfur, which will “bind” to the arsenic and trap it in a mineral form (arsenic sulfide) that can be safely stored deep underground (see Project 3 for more details).

Sulfur, in the form of sulfide minerals, occurs naturally in the rocks that were mined at Giant Mine. When mined and exposed to oxygen, sulfide minerals release sulfate, which can be found in the not-yet-treated wastewater at the mine. This form of sulfur cannot be used to treat the arsenic dust – but certain kinds of bacteria that live near Giant Mine may be harnessed to treat the water so it can. These bacteria “breathe” sulfate instead of oxygen in the wastewater to produce a form of sulfur, called “sulfide,” that binds with arsenic to make a mineral that is not very soluble.

**The goal of this project is to explore whether local bacteria can produce sulfide from not-yet- treated mine wastewater to treat arsenic dust at Giant Mine.**

This project has three steps. First, researchers will collect bacteria from nearby wetlands and feed them nutrients (e.g., from local food waste) to help them grow and multiply. Second, they will use the bacteria to process untreated wastewater from the mine and produce sulfide. Finally, they will add the sulfide to dissolved arsenic dust to trap the arsenic in a much less soluble mineral.

By harnessing local bacteria to produce sulfide from locally available mine wastewater, it should be possible to treat the arsenic dust while also improving the quality of the mine wastewater before it goes on to further treatment.

### PROJECT UPDATE

#### RESEARCH PROGRESS: 70%

**Where we are now:** Sediment samples from Giant Mine have been collected and analyzed. Sulfate-reducing bacteria from the samples were “fed” nutrients and incubated with simulated Giant Mine treatment plant water. Through these experiments, the bacteria produced significant concentrations of sulfide.

**What comes next:** Researchers have requested additional arsenic dust samples (from the samples collected in 2023), and additional analyses of the sediment and early experiment samples are underway.

## Testing the long-term safety of arsenic-containing glass

### PRESENTED BY

- Alana Ou Wang, Post-doctoral Fellow, Department of Earth and Environmental Sciences, University of Waterloo

Arsenic-containing mine waste (dust) can be transformed into a highly stable glass, which has the potential to provide a safe, permanent storage option for the arsenic dust at Giant Mine. However, Giant Mine dust contains many impurities and may not always behave as expected.

**The goal of this project is to stress-test arsenic glass samples, produced using arsenic dust from Giant Mine, and learn which conditions may cause arsenic to leak out. If the glass can withstand these tests, it may be strong enough to provide a safe long-term storage solution for the arsenic dust.**

This project includes several steps. First, researchers will study the glass to learn its physical structure and chemical makeup. Next, they will test crushed and uncrushed glass samples with a wide range of liquids (water, acids, and more) to simulate extreme environments and learn what might cause the arsenic to leak from the glass. By studying crushed samples, they can learn whether potential physical damage would increase the likelihood of arsenic escaping from the glass.

Finally, they will subject the glass to environments that might occur in storage. They will pack uncrushed glass samples into plexiglass cylinders and pass three types of water through them to mimic exposure to Giant Mine groundwater, Great Slave Lake water, or acid rain.

These tests will reveal whether the glass can withstand exposure to different conditions or if the arsenic will eventually escape into the natural environment. This information will also help the researchers identify the safest storage conditions for the glass.

### PROJECT UPDATE

#### RESEARCH PROGRESS: 90%

**Where we are now:** Researchers have finished analyzing the chemical and physical makeup of crushed and uncrushed glass. They have finished testing the samples that were exposed to different liquids and are currently preparing to report on the results. The water exposure tests using Giant Mine groundwater and Great Slave Lake water are complete. Vitrified glass released 10,000 times less arsenic in water at room temperature than untreated arsenic dust, and it performed well even at extremely high temperature and pressures.

**What comes next:** Researchers are preparing their results for publication. They have noted the importance of understanding storage conditions at Giant Mine to assess (and minimize) the likelihood of arsenic leaching from the glass once it is in long-term storage.



## Trapping arsenic dust in a cement paste to be stored underground

### PRESENTED BY

- Isabelle Demers, Professor, Research Institute on Mines and Environment, Université du Québec en Abitibi-Témiscamingue
- Nicholas Beier, Associate Professor, University of Alberta

Mixing the waste materials from mining (“tailings”) with cement for underground storage is a common practice in mine reclamation. When wet, the mixture is a thick paste that can be transported and pumped into underground storage chambers. Unlike regular cement, which hardens into concrete, a cemented paste contains much more water and hardens to a consistency like a stiff soil.

Arsenic trioxide is not a typical ingredient in cemented paste, meaning the mixture could behave in unexpected ways. **The goal of this project is to test different cemented paste mixtures – and the conditions needed for the paste to harden – to learn the most stable “recipe” for trapping and permanently storing the arsenic underground.**

This project has two steps. The first step is to test different recipes to see which produces the strongest cemented paste once hardened. Researchers will then place hardened samples from each recipe in moving water to see if any arsenic leaks out from them. The second step is to subject the cemented paste to the extreme temperature changes that might occur at Giant Mine. These changes include freezing before the paste has hardened, freezing for long periods, or repeated freeze-thaw cycles, all of which might weaken the final hardened paste (like soils heaving as they freeze).

Together, these tests will allow researchers to see if there is a mixture that will withstand the eventual storage conditions at Giant Mine without leaking arsenic into the environment.

### PROJECT UPDATE

#### RESEARCH PROGRESS: STEP 1 – 100%; STEP 2 – 70%

**Where we are now:** The first step is done. Researchers learned that adding arsenic dust causes the paste to behave differently than expected, and they identified the “recipes” that produced the strongest samples. Only the strongest samples remained solid in the moving water experiments, and even these had the potential for substantial arsenic release. The second step is underway; early results suggest that continuous freeze-thaw cycles cause the cemented paste to become very weak.

**What comes next:** Additional tests will be performed to assess the stability of arsenic in the samples and the effects of freezing and thawing on the cemented paste’s internal structure.

## Monitoring arsenic pollution using a stable isotope analysis of antimony

### PRESENTED BY

- David Blowes, Professor, Department of Earth and Environmental Sciences, University of Waterloo

Understanding where arsenic came from on-site and how it moves through the environment is important for managing and treating it in the future. This kind of information can be learned using a method called “stable isotope analysis.” However, this kind of analysis can only be performed using certain elements, and arsenic is not one of them.

Fortunately, arsenic has a close chemical cousin called “antimony” that can be used for stable isotope analysis. Antimony is found in the arsenic dust at Giant Mine and tends to “tag along” with arsenic. This means researchers can learn how arsenic behaves by studying the antimony that travels with it.

**The first goal of this project is to develop and test a method that uses antimony to monitor arsenic pollution in the environment around Giant Mine.** This work will make it possible to identify whether antimony (and thus arsenic) detected in a water sample came from the mine, and possibly even which storage chamber it came from. This could provide an early warning if arsenic enters the groundwater from any of the chambers, helping researchers quickly pinpoint the contamination source.

**The second goal is to enable more detailed testing of the potential permanent storage options.** The main challenge facing researchers is designing a method that is tailored to the arsenic dust and environment at Giant Mine. Stable isotope analysis using antimony is quite new, and researchers are breaking new ground by using it for this purpose.

Researchers will test samples from the other projects using stable isotope analysis and learn if there have been chemical changes that other methods could not detect. This is important because subtle chemical differences could impact a method’s long-term stability.

### PROJECT UPDATE

#### RESEARCH PROGRESS: 50%

**Where we are now:** Researchers have developed processes for purifying and recovering antimony and achieving precise isotopic measurements of Giant Mine-impacted samples. Samples have been collected from the Giant Mine project site, and researchers have completed water chemistry analyses of these samples.

**What comes next:** Isotope analysis will be conducted in 2025. Arsenic dust samples from the same location as Project 1 will be tested using isotope and other analyses to help corroborate and support characterization work. Influent and effluent water samples from Project 5 (i.e., the water going into experiments and the water that has been exposed to arsenic glass) will be tested using isotope analysis.



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## GMOB Office Staff



Ben Nind  
Executive Director

## CONTACT

**IN PERSON** Giant Mine Oversight Board  
5014-50th Avenue  
Yellowknife, NT

**MAIL** Box 1602  
Yellowknife, NT X1A 2P2

**TELEPHONE** 867.675.0788

**EMAIL** [ed@gmob.ca](mailto:ed@gmob.ca)

Or visit our website [www.gmob.ca](http://www.gmob.ca)

